

PUBLIC OWNERSHIP OF TELEPHONES ON THE CONTINENT OF EUROPE

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To My Mother

“Je ne propose rien, . . . j'expose.”

DUNOYER: *De la Liberté du Travail.*

PREFACE

COMPETITION in the telephone business has existed for nearly a score of years in a large part of the United States. By the expiration of the fundamental telephone patents in 1893 the legal barrier to active telephone competition was removed, and to the American public at that time competition seemed the promptest and most effective method of regulating the then existing telephone monopoly. Until the general economic crisis of 1907 the contest was hotly waged between the "Bell" and the "Independents." Since then a tendency has developed towards monopoly conditions in the telephone industry. To-day, in view of the altered conditions, the public is reconsidering the policy of competition as applied to telephones.

The alternative to competition is legal monopoly, either public or private. Either involves the active participation of the government in the management of the business. If the policy of private monopoly is adopted, the government may establish special rules in the form of "franchises" for the guidance of the managers of the private monopoly, or general rules in the form of regulation acts with public utilities commissions for their enforcement. If the policy of public monopoly is adopted, the government may set up special public authorities to manage the business in accordance with general rules laid down by law, or commit it to the charge of the postal authorities. In the hope that a knowledge of European experience with telephones might aid in the solution of the public problem which the American community must face, the investigation was begun which has resulted in this book.

In Europe various policies towards the telephone industry have been adopted: free competition between private telephone systems; competition between a private system and a governmental system; governmental regulation of private monopolies; and municipal and national ownership of governmental monopolies. This book has not been written to prove that any one mode of conducting the

telephone business is the best for all countries and under all circumstances. I have simply tried to set forth without prejudice the results of European experience in the conduct of the business. My object is to make available the evidence upon which the reader may form his own opinion of the value of the various policies that have been adopted. When it has seemed instructive to do so, I have not hesitated to make comparisons between American and European conditions; but the purpose has always been, not to propose alterations in the contemporary American policy towards the telephone industry, but to make more clear the nature of the European situation. The aim is not to show that a particular mode of conducting the telephone business, — say free competition or public ownership, — is in the abstract the best, but to show how in practice various forms of industrial organization actually have worked.

In order to accumulate the necessary evidence, the official reports of telephone companies and administrations have been studied, as well as the parliamentary debates upon telephone affairs, the technical periodicals dealing with the telephone industry, and the pamphlets and books on the subject. Conversations have been had with telephone officials, both in public and in private systems, in high and in low position, in favor of and opposed to each of the several modes of conducting the telephone business; with technical experts and inventors not employed directly in any system; with labor leaders whose chief interest in the telephone was as a source of employment to wage-earners; with business men and other telephone-users, and with economists and officials whose interest lay largely in the form of industrial organization of the telephone business. To write the book would have been impossible without the cordial support of practical telephone men. I am under deep obligations to many more of these than can be named here. Telephone officials, both in the public and in private service, have placed their stores of information at my disposal, and have given generously of their ripe experience and trained judgment. My obligations cannot be expressed to them all individually. Yet I cannot neglect the opportunity to record my appreciation of them as a class. If this book does no more than to aid in the establishment of more general confidence in the efficiency and loyalty

of the trained administrator and technical expert, whether in the employ of a private or of a public monopoly, the labor of writing will have been repaid. There is one telephone man who must be mentioned by name. I cannot send this book into the world without recording my gratitude to and esteem for Colonel Emil Frey, formerly president of the Swiss republic and recently director of the international telegraph bureau at Bern.

Originally undertaken as a thesis for the degree of doctor of philosophy at Harvard University, the book has been completed with the aid and encouragement of university teachers in five countries. To several of these a special debt of gratitude must be acknowledged: Professor Gustav Schmoller of Berlin, Professor Lujo Brentano of Munich, and above all Professor F. W. Taussig of Harvard.

A. N. HOLCOMBE.

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PUBLIC OWNERSHIP OF TELEPHONES
ON THE CONTINENT OF EUROPE

INTRODUCTION

PUBLIC OWNERSHIP OF TELEPHONES ON THE CONTINENT OF EUROPE

CHAPTER I

THE ORIGIN OF THE EUROPEAN STATE TELEGRAPHS ¹

IN the year 1793 the young French Republic was called on to face a life and death struggle for existence. France was threatened with simultaneous invasion from all directions by the allied forces. At Paris the urgency of prompt measures for the protection of the long frontier was clearly recognized. The magnitude of the danger made necessary the utmost despatch in preparing to ward off the impending attacks and the utmost economy in the disposition of the forces available for the defense. Yet no more rapid means of transmitting orders was available than the medieval courier. Equipped with his saddle bags and mounted on relays of fast

¹ My information in regard to the early history of the optical and electrical telegraphs is derived from the following works: —

- (a) *Lettres des citoyens Eymar et Chappe sur un nouveau télégraphe*. Paris, an VI.
 - (b) I. U. J. Chappe: *Histoire de la télégraphie*. Le Mans, 1840.
 - (c) Karl Knies: *Der Telegraph als Verkehrsmittel*. Tübingen, 1857.
 - (d) E. Sax: *Der Verkehrsmittel in Volks und Staatswirtschaft*. Vol. I. Vienna, 1878.
 - (e) P. D. Fischer: *Post und Telegraphie im Weltverkehr*. Berlin, 1879.
 - (f) A. de Foville: *La Transformation des moyens de transport et ses conséquences économiques et sociales*. Paris, 1880.
 - (g) G. Schöttle: *Der Telegraph in administrativer und finanzieller Hinsicht*. Stuttgart, 1883.
 - (h) A. Belloc: *La Télégraphie historique*. Paris, 1888.
 - (i) F. J. Huber: *Die geschichtliche Entwicklung des modernen Verkehrs*. Leipsic, 1893.
 - (j) J. Jung: *Zum fünfzigjährigen Bestehen der Oberpostdirektionen*. Berlin, 1899.
- The literature dealing with the early history of the telegraphs, especially in their technical aspects, is of course much greater.

horses, he spent the better part of a day in reaching the nearest frontier, and days were precious.

For a century or more the increasing scale of military operations had been making ever more and more urgent the need for greater speed in the transmission of intelligence. Men of an inventive turn of mind had long been puzzling their wits in the attempt to devise a mechanical substitute for horse flesh, which would clip hours off the schedules of the royal postal services. Yet until the arrival of the dark days of the First Republic all efforts had resulted only in failure. Then the old proverb proved true. Out of the necessity of that critical hour sprang the invention of the optical telegraph. In this very year, 1793, an ingenious Frenchman succeeded in perfecting the contrivance that was so urgently needed.

To Claude Chappe of Brulon belongs the credit for making the first practicable telegraph.¹ He erected signal stations on lofty eminences six to twelve miles apart, and equipped them with a pole and cross bar, at either end of which was a movable arm. By setting these arms in different positions he was able to designate the letters of the alphabet. Messages spelled out in this way could be read by an observer at the next station, employing a small telescope. An experimental line was hastily constructed between Paris and Lille, and in the summer of 1794 the first message was transmitted.

Such was the beginning of the optical telegraph. The French military authorities perceived at once the value of the invention and proceeded to construct optical telegraph lines as extensively as their lack of funds would permit; but they declined to open the new service to the public. The advantage of the improved means of communication seemed too great to be risked by permitting the lines to be used by possible enemies of the Republic. As for friends, they should have no cause to want to make use of it. So there the matter rested. The optical telegraph had been called into existence for military purposes, and for those purposes and none other it remained in existence.

Napoleon Bonaparte, whose keen judgment never failed to

¹ The Convention adopted Claude Chappe's proposal for a system of optical telegraphs on July 26, 1793.

appreciate anything that could aid in the accomplishment of his designs, valued the optical telegraph service highly, and extended the lines to Amsterdam, Mayence, Strasbourg, Hünningen, and Venice. Thus he kept his capital in close touch with the outermost extremities of his extraordinary empire. Under his successors, these lines were maintained and fresh lines were constructed. The last new line was built in 1842. At that time the French War Department operated over three thousand miles of optical telegraphs and maintained five hundred and thirty-four observation stations.¹

As is ever the case with improvements in the art of war, the originator of the optical telegraph was not permitted to enjoy the new contrivance alone. Before the end of the century the British Admiralty established a line connecting the offices in London with signal stations at the strategic points on the Channel. In 1796 the fear of invasion caused the hasty erection of lines to Dover and to Portsmouth, and other lines were erected later. All of these military lines were abandoned after the termination of the Napoleonic wars, and only one private line, serving the shipping interests between Liverpool and Holyhead, remained in operation. On the Continent, however, no construction of optical telegraphs could be undertaken by any but the French while Napoleon remained the master of the field. In fact, not till 1833 did the military administration of any other country establish optical telegraph lines. Then the Prussians connected Berlin and Coblenz, in order to secure more rapid communication between the western and eastern portions of their scattered dominions. There were sixty-one stations on this line. It cost over \$50,000 to build and more than half as much each year to maintain and to operate.² The Russians constructed a similar line between St. Petersburg and Kronstadt in 1839, and a few other lines of lesser importance are known to have existed during the first part of the last century. Like the heliograph once used by the American army on the arid plains of the far West, the optical telegraph was devised purely for military purposes and never obtained the patronage of the general public.

This result was not wholly the fault of the public, although in

¹ Schöttle, p. 184.

² *Ibid.*, p. 145.

general it displayed a surprising indifference to the optical telegraphs. In France a private company established a line between Paris and Rouen in order to serve the public. Before the enterprise had time to demonstrate its usefulness, the French government decided that it could not permit so important a military and political agency to pass into private hands, and in 1834 forbade further operation. Three years later, May 7, 1837, a law was enacted declaring the telegraph a governmental monopoly and making its infringement a criminal offense. Thereafter the general public took no further interest in optical telegraphs. In England, however, where private enterprise was under no restraint, the public indifference was equally great.

The optical telegraph service, great advance as it was over couriers and saddle bags, suffered nevertheless from certain serious defects. It could not be operated at all by night, and even by day its service was dependent upon the weather. In the foggy atmosphere of Great Britain the service could be maintained on the average only sixteen hundred hours in a year, or less than one hour in five. Even under the sunny skies of France the annual average amounted only to twenty-one hundred hours.¹ Moreover, the operation of the service was laborious. Each operator had to lie all day with his eyes glued to his telescope, and the slightest negligence could easily give rise to intolerable delay and annoyance. Attempts were made during the forties to increase the scope of the apparatus by the use of lanterns at night, but these proved not very successful and altogether too expensive. The operation of the service was already costly enough, and military authorities were reluctant to sink more of the public money for so small a return. Having once become dependent on rapid facilities, the telegraph authorities could not remain indefinitely satisfied with the existing service. Clearly the time had come for another radical improvement in the mode of transmitting intelligence.²

The new radical departure was the substitution of electricity for light as the telegraphic agency. We are apt to mark the dawn of

¹ Schötle, p. 183.

² For a curious bit of verse lamenting the passing of the optical telegraphs, cf. Löper: *Stammbuch der neueren Verkehrsmittel*, pp. 318-22.

the age of electricity with Benjamin Franklin's spectacular experiment with the kite. But a long period intervened before the mysterious force which Franklin first drew from the sky could be harnessed to the uses of man. It was not till after more than half a century that the first electrical telegraph was constructed. In 1809 Professor Sömmering of Munich constructed an electro-chemical telegraph, which he operated by the aid of thirty-five wires. The inventor was thoroughly convinced of its superiority over the optical telegraph. "Its application," he wrote, "is not restricted to the daytime, but may be extended to the hours of darkness; neither clouds nor mists interfere with its operation; it covers any distance without the use of relays; it speaks a secret language and its speed is beyond calculation."¹ But it was not by the way of electro-chemistry that the optical telegraph was destined to be superseded.

Sömmering's method was rendered obsolete by the marvellous discoveries that shortly followed in the field of electro-magnetism. The new era really began in 1819 with Oersted's chance discovery of the relationship between the galvanic current and magnetism. It terminated, at least for telegraphic purposes, in 1831 with Faraday's final statement of the laws of induction. Thereafter progress was rapid. Professors Gauss and Weber, at Göttingen, performed their celebrated experiment with an electro-magnetic telegraph in 1833. The new ideas quickly spread. William Cooke, a young Englishman then studying on the Continent, witnessed an experiment in telegraphy at a scientific lecture at Heidelberg in 1836. He recognized at once the practical value of the device for railroad service and invented an appliance for restoring the needles with which the signals were given to their original condition when the magnetic current should release its hold. Returning to England, he allied himself with Professor Wheatstone, but their instrument was still too crude for practical application. The next year the two succeeded in telegraphing experimentally from the Euston railroad station at London to another point on the line.

Meanwhile in the United States Morse was already at work independently, using an electro-mechanical recording device in-

¹ *Handbuch der Elektrotechnik. Band 12. Telegraphie und Telephonie*, 2nd edit., p. 9.

stead of a set of needles or indicators to reproduce the message. In the same year, 1837, but somewhat later than Wheatstone and Cooke, he performed his first successful experiment. Simultaneously Steinhilber at Munich, who had also been working on the problem, discovered that the earth could be used to conduct the electric current back to its source, thus dispensing with the use of a second wire to complete the circuit. An illustration of the remarkable need for the more rapid transmission of intelligence at that time is the fact that seven years later, when Morse sent his famous message from Baltimore to Washington, he still employed two wires to complete the electric circuit. In all three countries experimentation went on apace, inventors in each country having little or no knowledge of what was going on in the others. In 1840 Morse invented the key and the alphabet called after his name. These devices made his telegraph by far the simplest and the most efficient in existence. Yet so slowly were ideas disseminated in those days that it was ten years before the first Morse instruments were introduced into Germany.¹ Their superiority was then immediately recognized and they quickly replaced all other models.

In the United States and in Great Britain, as soon as the telegraph had been demonstrated to be something more than a scientific toy, it was taken up and rapidly exploited as a commercial enterprise. The Electric Telegraph Company bought up Wheatstone and Cooke's patents in 1846, and quickly covered the country with a network of lines. Within eight years several other companies had been organized to compete with the pioneer company and the telegraph systems had attained an extent of over twenty-five thousand miles.² In the United States the organization of competing companies was still more rapid and the development made even greater headway.

On the Continent of Europe it was otherwise. Commercial telegraph companies did not spring into existence. Speculative business men, fired with the desire to exploit the new invention, simply failed to present their appearance. Here and there a small

¹ Werner von Siemens; *Lebenserinnerungen*, p. 83. Schöttle (p. 146) gives the date as 1847.

² Knies, p. 147.

local railroad experimented with the new invention for signal purposes, but that was all. The general public showed no desire to share in the use of this time-saving contrivance, seeming well content to go on doing business in the old way. The public administrative and military authorities alone displayed any active interest in the improvement of existing means of communication.

In France the first electric telegraph line was constructed in 1845 by the government for its own purposes. Like the existing optical telegraphs, this line was not open to the public. A year or two later a railroad company established a short line, for operating purposes only, from Versailles to St. Germain. Further private construction was forbidden by the government, nor does this action appear to have occasioned any outburst of adverse criticism. In the middle of the nineteenth century war, both foreign and domestic, was never a remote contingency in European politics. The powers that were had every incentive to prevent an important military and political instrument from passing beyond their control, to fall perhaps into improper hands. Self-preservation is ever the first principle of statecraft. The French acted upon it. Thus the Minister of the Interior, Lacave-Laplagne, declared in the French Chamber of Deputies, July 12, 1847, "*La télégraphie doit être un instrument politique, et non un instrument commerciale.*" The same attitude was maintained by the administrative authorities after the fall of the July Monarchy and the rise of the Second Republic. Thus Léon Faucher, the Minister of the Interior, declared in the Chamber of Deputies, April 4, 1849: "*La question est politique avant d'être commerciale.*" He accordingly refused to open the telegraph system to the public.

By 1847 the French military authorities were convinced by their own experiments of the superiority of the electro-magnetic over the optical telegraph. But since they already possessed an unrivaled system of communication by the latter means, they could better afford to await further developments than could their rivals.

In Germany the situation was different. In the south there was no one commanding power with great interests to be jealously guarded. Private enterprise had an opportunity to show what it

could do. It did practically nothing. A few short railroad lines were put up experimentally, but of ordinary commercial construction there was none. In Saxony, in 1847, the newspapers contained rumors of the formation of a company to build a line between Dresden and Leipzig, but nothing ever came of it.¹ In some of the South German states the question of private or public ownership never even arose, since the railroads, the only commercial undertakings which felt the need of rapid telegraph service, were themselves in the hands of the public authorities. Thus in Wurtemberg, where the government had built its own railroads despairing of ever getting an adequate system by relying on the unaided efforts of private enterprise, a telegraph signal service was quietly installed by the state railroad management without even attracting the notice of the public.²

In Prussia, political considerations had more weight, and the military authorities displayed from the first a keen interest in the new invention. The defects of the optical telegraph and the advantages of improving it were clearly recognized. In 1846 a military commission was appointed to investigate the possibilities of electrical telegraphy, and an experimental line was built from Berlin to Potsdam. Werner Siemens, who afterwards became the head of the great electrical house of Siemens and Halske, was at that time a young officer in the Prussian army and played an important part in this early experimental work.³ In the following year, convinced of the future of electrical telegraphy, Siemens resigned his commission in the army in order to found a private telegraph construction works. The military authorities shared his sanguine views of the usefulness of the new invention, and in 1848 re-enlisted Siemens' services in order to carry out the construction of the most urgent lines of the comprehensive system which they had planned. In February, 1849, he completed the line between Berlin and Frankfort-on-the-Main, in order to establish rapid communication between the Prussian capital and the seat of the ill-fated German National Congress. Further construction was pushed with vigor. The optical telegraph line to Coblenz

¹ Schöttle, p. 152.

² *Ibid.*, p. 216.

³ Werner von Siemens: *Lebenserinnerungen*, pp. 43, 68.

and Aachen was abandoned in May, and before the end of the year Hamburg, Stettin and Breslau had also been connected with the capital.

The next step was to open the service to the public. This involved a radical departure from previous policy. Yet since the systems were there and cost money to keep up, the military authorities deemed it sensible to let the public share in their use, if it cared to, and help defray the expense. To be sure the public might not care to make use of the system. Yet there could be no harm in creating the opportunity, provided the government reserved precedence for its own despatches and exercised a strict supervision over the use of the service by private individuals.

Werner Siemens, having again set up for himself in the business of manufacturing telegraph instruments and constructing lines, warmly espoused the cause of the public. He pointed out that the saving of time by the new telegraph system was so great that even if the old optical telegraphs had been regarded with indifference, there would undoubtedly spring up a remunerative public demand for the services of the improved system. The Prussian military authorities at first demurred, but eventually decided in favor of opening the electric telegraphs to the public. In 1849 the military commission for the study and improvement of electrical telegraphy was dissolved and the service was placed under the direction of the newly created Board of Trade. On August 6, 1849, the Prussian state telegraphs were officially opened for ordinary commercial communications.¹

The Austrians were not far behind. To be sure, as long as Metternich remained in power, little was done. Alone among the great powers, Austria had neglected the optical telegraph and took no notice of the electrical until 1846. Then experiments were begun along the government railway from Vienna to Brunn. In the same year Metternich issued a decree declaring the telegraph to be a monopoly of the state. Here he stopped. But after the events of 1848 had put an end to Metternich's régime, the work of building telegraphs was taken up with great energy. The policy of the new government was the counterpart of the Prussian policy. In June,

¹ Jung, II, p. 25.

1849, the system was established and in October tentatively opened to the public. The authorities were satisfied with the experiment, and in the following year the opening was confirmed.¹

In France likewise, the events of 1848 gave a new impetus to telegraph construction. The Second Republic took the matter in hand, and the system was officially opened to the public by the law of November 29, 1850, with reservation of precedence for the public despatches. The governmental service, however, still remained the prime purpose of the telegraph, which continued until 1878 under the administration of the Minister of the Interior, the head of the national police. Moreover, the government still clung to its optical telegraphs, a fact which caused electrical construction to drag. Up to December 2, 1851, comparatively little had been accomplished. After the *Coup d'État* Louis Napoleon, who well understood the value of rapid and reliable communication with his civil and military prefects, pushed the work of fresh construction, but it was not until 1855 that the once splendid system of optical telegraphs was wholly abandoned.²

In Belgium a concession to introduce the electrical telegraph was granted to Wheatstone and Cooke in 1846. They built their first line to connect Brussels and Antwerp. But they had misjudged the Belgian public. They found no business except stock exchange traffic and could scarcely cover the expenses of operation. The company accordingly declined to build additional lines when requested to do so by the government, and in 1850 gladly sold back its original undertaking to the public authorities, who by that time had come to the conclusion that they must build their telegraph system themselves if they were to have one at all commensurate with the administrative needs. The government constructed lines on the state railroads and opened them to the public. In 1851 other lines were also opened to commercial communication, and the system soon proved profitable.³

In the Netherlands a royal ordinance of December 8, 1847, prescribed the conditions under which private persons might establish telegraph undertakings.⁴ The government reserved the right

¹ Schöttle, p. 173.

³ Knies, p. 117.

² Knies, p. 118.

⁴ *Ibid.*, p. 117. Schöttle, p. 176.

of precedence for state despatches, of operation by the public authorities in time of war, of approval of rates, and of compensation for loss occasioned to the postal revenues by the competition of the telegraphs. The conditions were certainly not very alluring. The Holland Railway Company, however, which since 1845 had operated a line exclusively for signal purposes, at once opened its service to the public. In 1851 a line was opened between Amsterdam and Nieuwediep to serve the fishing interests. Here private enterprise stopped. Hence, March 7, 1852, a law was enacted providing that the government itself should build the important lines at once, leaving to others only the secondary lines. As a matter of fact, what eventually happened was that the local municipal authorities had to undertake the task of completing the Dutch telegraph system after the central government had constructed the main trunk lines. In 1857 the rule was established that thereafter new telegraph offices should be erected by the cities and villages themselves but operated by the royal government. After the first year of operation, the local authorities were required to decide whether or not they wished to have the operations continued. In the former case they were required to guarantee a minimum amount of receipts, fixed according to the character of the service supplied.¹ In either event, the state was secured against loss.

The most successful instance of the combination of public and local enterprise occurred in Switzerland. The peculiar topography of that remarkable country had delayed the introduction of railroads. Moreover, there were lacking those military and political motives which were the strongest factors in bringing about the introduction of the telegraph into the more powerful countries of continental Europe. Hence the Swiss authorities did not pounce on this new agent of centralization so promptly as some of their neighbors. On the other hand, private enterprise showed little disposition to exploit the telegraphs as a commercial venture.

An enlightened population, however, could not long dispense with such an important improvement in the means of transmitting intelligence. A federal law of December 23, 1851, declared the

¹ Schöttle, p. 104.

telegraph to be a public service and provided for the immediate beginning of construction. A loan of \$80,000 was raised from the public-spirited population without payment of interest. This loan was repaid within five years out of the proceeds of operation. Meanwhile the lines, as fast as constructed, were put at the free disposal of the public until the entire system was ready to be opened. This was done on December 5, 1852. Provision for the further extension of the system was made by a federal law of December 20, 1854. It was ordained that the condition of the establishment of a new office should be a moderate contribution by the local authorities to the expenses of construction and operation. They were required to put a right of way at the free disposal of the federal telegraph administration, to provide accommodations for the office, and to guarantee from operation each year during the first ten years after the opening, a sum equal to seventy-five cents for each one hundred members of the local community, but to be not less than forty dollars. These contributions made it possible for the government to establish low rates. The arrangement was well adapted to the nature of the country and the temperament of the people. The result was that in 1856, only four years after the beginning of work, Switzerland possessed relatively to her size and population the most extensive telegraph service on the Continent of Europe.¹

The spread of the telegraph throughout Europe was rapid once the greater countries had led the way. R. van der Borcht, in his treatise *Das Verkehrswesen*, gives the following dates of the opening of the various state telegraph systems to the public: 1849, Prussia and Austria; 1850, Bavaria and Saxony; 1851, France, Belgium, Wurtemberg, Baden; 1852, Sardinia, Parma, Modena, Tuscany, Hanover, Holland, and Switzerland; 1853, Sweden; 1854, Denmark and several of the smaller German states; 1855, Norway, Spain, and Portugal; 1856, Russia and several of the Balkan States; 1857, the Two Sicilies; and 1859, Greece. In no country were any important lines undertaken by private enterprise. The unanimity of the contemporaneous sentiment which sanctioned the public ownership of the telegraphs was reflected in the deliberations of the

¹ Knies, pp. 118-22.

German National Congress at Frankfort in 1848-49. That body cannot be accused of any inclination to encourage what might be considered illiberal practices. Section 44 of its ill fated constitution was to have provided for the organization of an imperial telegraph system, to be administered as a governmental undertaking throughout all Germany.

The further history of the European state telegraphs need not detain us.¹ We are interested, not in the conduct of the telegraph business itself, but in the situation which existed at the time of the invention of the telephone. Enough has been written to show what were the main motives that brought about the introduction of the electrical telegraph upon the Continent of Europe. The economic motive which leads men to seek a profitable investment for their capital and energy was not one of them. Private enterprise never showed any disposition to engage in the telegraph business on a scale that would have made the service of much use to the general public. If the public authorities had done nothing, doubtless sooner or later the scattered railway signal services would have developed into services of real public benefit, or else commercial undertakings would have entered the field directly. In the beginning, however, the general public was indifferent to the electrical telegraph. The needs in response to which the electrical telegraphs were first called into existence, on any considerable scale, were purely military and political, and they were anticipated and satisfied by public authorities themselves.

¹ The significance of the experience of the continental countries with government ownership of telegraphs was the subject of a lively discussion in England just before the nationalization of the telegraphs of the United Kingdom in 1870. Cf. (a) F. I. Scudamore: *A Report to the Postmaster-General upon Certain Proposals which have been made for transferring to the Post-Office the Control and Management of the Electric Telegraphs throughout the United Kingdom*, July, 1866; also, (b) *A Supplementary Report (on the same)*, February, 1868, in the *Parl. Papers* for the corresponding years. Cf. also (c), the *Special Report from the Select Committee on the Electric Telegraphs Bill*, 1868, and (d) the *Report on the Telegraph Bill*, 1869.

PART I

PUBLIC OWNERSHIP OF TELEPHONES IN GERMANY

CHAPTER II

THE PROMOTION OF TELEPHONE UNDERTAKINGS BY THE TELEGRAPH AUTHORITIES

THE leading feature of the economic history of Germany during the nineteenth century was the growth of the spirit of business enterprise. The economic evolution of the last one hundred years, from the point of view of the manual laborer, has been characterized by the development of the class of wage earners at the expense of the independent workman. But this implies a corresponding development of the class of wage payers, who become less and less hand workers and more and more brain workers. The wage payer undertakes not only the task of organizing and directing the efforts of his workmen, but also that of anticipating the future wants of his market and regulating his output in accordance with the prospect for its sale. He may even delegate the labor of superintendence to a foreman, but the task of adjusting the supply to the demand, the function *par excellence* of the business man, he always retains in his own hands. In the case of a stock company, there is an application of the representative principle to the conduct of business ventures, but the nature of the service for which the stockholders receive a return other than the market rate of interest on their investment is the same. It is this *courage du capital*, as the French phrase it, or the spirit of business enterprise, as we employ the term, that has taken over from the medieval guilds the control of the market and with it the task of ascertaining the wants of the community and of delivering the goods that are desired.

At the dawn of the century there was very little room in Germany for such a display of private initiative. Both the three-field system of agriculture and the guild system of industry were conducted on a collective basis. No individual was free to act except in accord with his fellows. The effect of the economic evolution of centuries had been to strengthen the bonds of mutual dependence

between persons engaged in the same occupation. In the United States a century ago the situation was the exact reverse. In the younger country the most important qualifications for gaining a livelihood were personal initiative and self-reliance. These are precisely the qualities that are best fitted to nourish the *courage du capital*. Hence the American farmer promptly developed into an enterprising business man as soon as the opportunity presented itself. But it was no easy matter for the German to display similar qualities, when they happened to be born in him, unless he wrenched himself free from the ossified environment of his native land and began life afresh in the less rigid atmosphere of the newer country on the other side of the Atlantic. In short, private enterprise was torpid in the Germany of a century ago because medieval conditions still dominated economic life, and medieval conditions left little room for private enterprise.

This peculiar psychological condition of the German people helps to explain their failure to introduce the telegraph by private initiative. Thus the explanation of the construction of the first telegraph systems by the public authorities lies not only in the fact that they felt a need for the service and private individuals did not, but also in the scarcity of business men animated by a desire to undertake such ventures. The relatively small body of merchants and bankers in the German cities were content to conduct their business in the old ways and refused to bother their brains about such an innovation as the telegraph. Consequently the public authorities, on account of the military and political conditions which have already been described, were forced to undertake the task themselves.

It must not be supposed, however, that the early public telegraph authorities were animated by the spirit of business enterprise. The spirit that prompted the public authorities to establish those early telegraph systems was very far removed from what we have called the spirit of business enterprise, the spirit which prompts a community, or individual members thereof, to look ahead into the future with a view to anticipating a hitherto unsatisfied want in the community and to setting about at once to supply that want in advance. There was no such complicated

psychological process at the bottom of the first attempt to establish the telegraphs. The public authorities felt a need of their own, and finding no one else to supply it for them, set to work to supply it for themselves.

The governmental officials who undertook the management of the telegraph systems felt themselves under no obligation to serve the public, nor was such service expected of them by public opinion. Public ownership of telegraphs in the beginning was not, strictly speaking, a manifestation of the spirit of business enterprise. It was simply a branch of the public administration, forced upon the government by the lack of private enterprise. Meanwhile, however, the spirit of modern business enterprise was making great progress in German industrial life. Yet, as a nation is but a collection of individuals, it naturally first took the form of private business enterprise. The question next arises, would the community as a unit, acting through the public authorities, show itself capable of a similar development of public business enterprise?

The opportunity came with the invention of the telephone. Ever since the telegraphs had been thrown open to the public, more or less effort had been made, according to the character of the telegraph administration and the military and political situation of the country, to consider private as well as public wants in administering the service. Yet, on the whole, it is not unfair to say that political rather than economic needs had received primary consideration. Already opportunities for a convincing display of business enterprise had been declined by several telegraph administrations. For example, local urban telegraphs were never undertaken by any government, although a need for them appeared in several cities. In Vienna a concession for an urban telegraph system was granted to a private company in the early sixties, and the same thing was done in Paris a decade later, for the purpose of distributing stock exchange quotations. In Berlin, however, the telegraph authorities met a somewhat similar need by the establishment in 1876 of a system of pneumatic tubes. The grand opportunity came with the invention of the telephone.

The telephone is a device for rendering the same kind of service

as that rendered by the telegraph, — it saves time and labor in the transmission of messages. At first, indeed, the fact may not have been obvious that the two instruments were capable of supplying precisely identical services. The technical deficiencies of the early telephones may often have led to the belief that the two instruments would never come into direct competition with one another. But even at the time of the invention of the telephone, the kinship between it and the telegraph was unmistakable.

The public telegraph authorities were under obligations to display their capacity for the management of the great business undertaking which had sprung up under their care by making a prompt application of the new invention to the improvement of telegraphic communication. Failure on their part to ascertain the need for the telephone and to take steps for its immediate introduction where it should be demanded, would indicate that they were unworthy of further confidence in the management of important business undertakings. The reasons which actually led to the public ownership of telegraphs were already deemed inadequate by the economists of the next generation for the justification of the continuance of that policy. They pointed out the advantages of centralized management and of organization on a large scale, and argued that the public authorities must realize those advantages; otherwise the wisdom of the retention of the monopoly in public hands was open to question.¹

The first telephone was invented and so named by a German, Philipp Reis by name.² He was a teacher in a boarding school at

¹ Cf. E. Sax: vol. i, p. 228. The Austrian economist argued that the growth of the spirit of business enterprise on the Continent would now make feasible the farming out of the telegraph systems, if the public authorities should prove incapable of managing them in a business-like manner. He was confident, however, that they would not show themselves incapable. Adolf Wagner, on the other hand (*Finanzwissenschaft*, Part 1, 3rd edit., 1883, pp. 652-56), considered that the telegraph was too important an administrative instrument to be surrendered to private control under any circumstances. Sax had no knowledge of the telephone when he wrote, and Wagner gives it no special consideration.

² Cf. Schenk: *Philipp Reis, der Erfinder des Telephons*, 1878; *Geschichte und Entwicklung des elektrischen Fernsprechwesens*, 2nd edit., 1880. A pamphlet appeared at London in 1891 by one W. Coldbrook, claiming to prove that the invention of the telephone was predicted in the Book of Revelation.

Friedrichsdorf bei Homburg vor der Höhe in Hessen-Nassau, and demonstrated in the year 1861 that sound could be conveyed by electricity and reproduced at a distance. His instrument, however, was based on a wrong principle, that of the make-and-break circuit, and was impracticable for commercial purposes. Reis received no encouragement from his contemporaries, either official or scientific, and died in 1869 a disappointed man. Bell's telephone, based on the correct principle of a continuous current as the actuating medium, seems first to have become known in Germany through the report of the Board of Judges of the electrical exhibit at the Centennial Exhibition at Philadelphia in 1876. Sir William Thompson, later Lord Kelvin, was especially impressed with Bell's invention and introduced the idea to European scientific circles.¹

At that time, Heinrich von Stephan was Postmaster-General of Germany and manager of the Imperial Telegraphs.² He was founder of the Universal Postal Union and a man of exceptional administrative capacity. He at once seized upon the new idea and began experimenting in the summer of 1877. His results are described in an enthusiastic letter penned to the Imperial Chancellor, Prince Bismarck, November 9, 1877.³ He relates how he ran a wire from his office in Berlin to the suburb of Friedrichsberg and on October 4, 1877, succeeded in establishing telephonic communication. He was delighted with the success of the experiment and predicted a great future for the telephone. At the same time he announced his intention of making at once a practical application of the new invention in the imperial telegraph service. He proposed to utilize the telephone instead of the telegraph in country

¹ R. van der Borcht: *Das Verkehrswesen*, p. 373.

² The German imperial telegraph system was created by the constitution of 1871. In Prussia the telegraphs had remained a part of the postal service until 1867. Then on account of the stress of work caused by the war with Austria they were erected into a separate department under the management of a military officer. In the following year the telegraph service was made over to the North German Confederation, and in 1871, together with the telegraphs of the other German states except Bavaria and Wurtemberg, to the German Empire. Under military management the service showed recurrent deficits, and in 1875 was joined once more to the post office. By this change it fell into good hands.

³ Reprinted in Heilbrun: *Telegraphie und Telephonie*, pp. 475-76.

post offices to which the telegraph service had not yet been extended. The telephone did not require a trained operator and hence could be operated more cheaply than the telegraph. At the same time it was capable of rendering an equivalent service on lines not more than fifteen or twenty miles in length. It would, therefore, prove very serviceable in those rural communities which were too poor to afford a regular telegraph service. By the end of the same year Stephan had already brought fifteen rural villages into the general telegraph system by means of telephone connections. By the end of the following year the number had risen to 287, and during 1879 over 500 more villages were brought into connection with the outside world by the same means.¹

This introduction of the telephone into the German telegraph system was its first application anywhere in the world as a means of regular public communication. In America Bell's remarkable invention had not yet reached that stage in its development. There were a number of private lines connecting different parts of the same business establishment, or different establishments having common interests, but the first public exchange system was not established until several months after the opening of the first public lines in Germany. To Stephan belongs the credit for being the first to discern the public need for the telephone and to undertake to satisfy it. It was at once a personal triumph for the German administrator and a landmark in the history of public ownership in Germany.

It will be observed that the first public telephone systems in Germany and in the United States were established with a view to satisfying entirely different needs. In the latter country the need was for an exchange service between members of the same community. In the former it was for a toll service between different communities. In America the telephone was a much wanted substitute for the slower district messenger service. In Germany it was a substitute for the more costly rural telegraph service. A long delay was necessary before the peculiar American conditions permitted of a similar application of the telephone in that country.

¹ J. Jung: *Entwicklung des deutschen Post- und Telegraphenwesens in den letzten 25 Jahren*, p. 84.

In Germany the introduction of the American local exchange service was possible after a comparatively short interval.

Within a couple of years American speculators had made their way to Europe with the purpose of exploiting the telephone in the more important commercial centres.¹ In 1879 two companies were organized in London to establish a local exchange service, and concessions for the same purpose were being sought on the Continent. Stephan at once took an interest in this new application of the telephone and saw that it met a real need. Accordingly in the year 1880 he decided to introduce the telephonic system of communication into the German urban telegraph service, as he had already introduced it into the rural service. This decision could be executed only with the coöperation of the public, and the public had already been invited within half a decade to support one innovation in the local system of communication. But Stephan proved equal to the occasion. Sending out canvassers into the financial and wholesale districts of Berlin, he soon obtained the pledges of one hundred subscribers, and on April 1, 1881, the local facilities for the rapid transmission of intelligence were increased by the addition of the telephone exchange to the existing system of pneumatic tubes. In the same year, sometimes on the initiative of the telegraph administration, in at least one case — that of Mülhausen — in response to that of local business men, exchanges were opened also in Hamburg, Cologne, Frankfort, Breslau, Mannheim, and Mülhausen in Elsass. The construction of further exchanges was already approved and the succeeding years witnessed a rapid extension of the service.²

The German telegraph administration attempted to meet another sort of need for speedier communication by the establishment of the so-called territorial telephone systems (*Bezirks-Fernsprecheinrichtungen*). The nature of this service was the combination with a local exchange service of an inter-urban toll service open to all subscribers at a flat rate per annum. The close proximity of German cities in certain industrial districts and the magnitude of their common interests created a strong demand for closer connections between the individual cities of the district. The same

¹ Schöttle, p. 137.

² Jung, I, p. 85.

circumstances also made such inter-urban systems more feasible than they would have been in the United States in the existing crude condition of telephone technique. The first territorial telephone system was established in 1884 in the Upper Silesian coal district. During the next half dozen of years similar systems were established in a number of other industrial districts, some of them embracing an area of as many as six or seven hundred square miles.¹

In the same year (1884) in which a territorial telephone system was first established, and in response to a somewhat similar need, ordinary long-distance service was likewise established. This was intended to serve more diversified interests and over longer distances than the other, and was made possible only by the progress of technique which had occurred since the early days of the telephone. At first audible conversation was not possible beyond a score or two of miles, but as a result of the indefatigable efforts of the telephone engineers, both in Europe and in America, the range of effective communication was rapidly extended.²

Finally, the German telegraph authorities did not neglect to make provision for the establishment of private telephone lines. They had assumed from the beginning that the telephone was simply an improvement in telegraphy which fell within the province of the public telegraph system authorized by section 48 of the constitution of the empire. Nevertheless, they saw the wisdom of encouraging private persons to establish their own connection with the public telegraph system in order to facilitate the service of purely private needs. An administrative order of November 22, 1882, regulated the conditions under which such private connections with the public telegraphs would be permitted. At no time, moreover, was there any restriction upon the construction of private lines wholly within the bounds of private property for the sole use of the owners. At the end of the year 1891 there were 2,301 private lines connecting with the public service and 2,871 purely private telephone systems.³

In putting the telephone service at the disposal of the public in anticipation of the demand, the German telegraph authorities

¹ Jung, I, p. 87.

² *Ibid.*, p. 89.

³ *Ibid.*, p. 90.

made a highly commendable record. It was a record of which they have all the more reason to be proud, since at that time private enterprise in Germany had attained a growth which, reinforced by the energy of American speculators, would readily have relieved the public authorities of their self-imposed task. Their refusal to take advantage of this circumstance denotes a recognition of the obligations that go with the public administration of such a service as the telegraph. In other words, it reveals the possession by the German telegraph authorities of the true spirit of business enterprise. A final judgment upon their conduct of affairs must be suspended until after an examination of their subsequent policy with regard to the maintenance of an adequate supply of facilities and of an efficient quality of service. Before proceeding to this part of the inquiry, the history of the introduction of the telephone into the two independent South German telegraph systems deserves some consideration.

In Bavaria and Wurtemberg German methods were applied on a smaller scale, which permits of a closer examination of the details of German administrative practice. The first appearance of the telephone in Stuttgart, the capital of Wurtemberg, is related in the report of the Stuttgart Chamber of Commerce and Industry for the year 1880.¹ Early in the year 1880 a representative of the American Bell Telephone Company, Armin Tenner by name, came to the city and began to canvass the field for subscribers to an exchange system. At the same time he sought a concession from the government for thirty years. At the end of that period the plant and business should revert to the state free of charge. Without waiting for the concession to be granted, but relying on the support of the municipal authorities, Tenner began to put up wires over the public ways and prepared to open his exchange. At this point the Wurtemberg state police stepped in and put a stop to further proceedings.

The telegraph administration had decided not to permit the telephone business to fall into alien hands. At this time it was a disputed legal question whether or not the telegraph was a gov-

¹ HGK Stuttgart, 1880. For an account of the relations between the chambers of commerce and the public authorities, see the next chapter.

ernmental monopoly.¹ No legislation had ever been enacted in Wurtemberg in regard to the telegraph. Section 48 of the imperial constitution of 1871 simply provided that the telegraphs should be administered as a centralized undertaking by the imperial telegraph authorities. A later section provided for the retention by Bavaria and Wurtemberg of the management of their telegraphs, so far as intra-state business was concerned, but no monopoly was specifically granted to any public authority. Hence, when some of the German municipal authorities were approached by representatives of the Bell Telephone interests with a view to obtaining concessions for local exchanges, there was a disposition in some quarters to grant the desired concessions. Among others were the local authorities at Stuttgart. However, in October, 1880, Postmaster-General Stephan issued an order stating that "the erection of telephone connections as *Verkehrsanstalten* (i. e. means for the transmission of intelligence by the general public) by others than the imperial postal authorities, or those to whom the latter should assign their rights, was forbidden." This flat assumption of power not only put a stop to the construction of public telephone systems by private enterprise within the imperial postal area, but also laid down a principle of constitutional interpretation which the Wurtemberg and Bavarian authorities were bound to follow.

In a sitting of the Wurtemberg Landtag which was held on December 14, 1880, one of the ministers of the Crown declared: "So far as concerns the capital needed to start a public telephone system in Stuttgart, we shall have no difficulty provided we can secure thirty-six subscribers. If we are unable to obtain so many, then it is questionable whether we should undertake the venture at all. At the time I will not say that under these circumstances a concession ought to be granted to the American company. If it is to be only a matter of a small loss for the state, I should be inclined to request the house to sanction the venture, in the hope that ultimate success will enable us to recoup the initial losses." These were bold words to be spoken by a government official, and evoked a loyal response in the legislature. Accordingly the tele-

¹ Cf. F. Meili: *Das Telephonrecht*.

graph authorities at once sent out a call for subscriptions to its proposed exchange system, but only seventeen were received. The venture was then temporarily dropped.

The author of the annual report of the Stuttgart Chamber of Commerce and Industry displayed a good deal of chagrin at the failure of local business men to make a better response to the telegraph authorities' offer. He ascribed the failure to two causes. First, business men in Stuttgart were not so eager to secure telephone connection as in the larger German cities, because city distances were shorter. Indeed, he went on to say, on the Continent in general, the need for telephone exchange service was not as great as in America "on account of the more compact construction of most of the older cities." Even in Berlin itself the response to the call for subscriptions had not been as great as was expected, a fact which seemed to show that it would have been better to have left the initial work of introducing the telephone to private enterprise. The latter would be more energetic in awakening the public to a realization of the merits of telephone communication. But, he was careful to add, the concession should be granted only for a short term of years. In the second place, business men were deterred from sending in their subscriptions by the height of the charges and the requirement of a two years' contract. The report closed with a prophecy of a rapid increase of subscribers once the exchange should be established and an appeal to the telegraph authorities not to abandon their venture on account of the result of the preliminary canvass.

This is an interesting report. In the first place the author recognized very clearly the influence possessed by purely physical conditions over the demand for telephone service. His suggestion in regard to a short-term concession as a device for shifting the burden of the initial risk to private enterprise was a not unnatural one. Public authorities the world over have found that a seductive means of evading responsibility. In this case it possessed an additional power of seduction inasmuch as it would relieve the Chamber of Commerce and Industry of its share likewise of the burden of educating public opinion. The author of the report was shrewd enough to discern that aspect of his case and did wisely not to

press his suggestion. As a matter of fact, the device was actually tried in a number of countries, and the results of the policy of evasion of responsibility will receive attention in a later chapter. It will suffice here to observe that the proposed rate was the same as that established in the rest of Germany and was very much lower than the rates established in the earliest exchange systems in England and France. Most interesting of all is the fact that the confidence of the author of the report in the future of the telephone was shared by the public telegraph authorities.

The sequel is contained in the report for the following year.¹ In January, 1882, one of the ministers of the Crown summoned a meeting of representative business men and begged their co-operation in the work of establishing an exchange. At the same time he promised a reduction of 20 % in the rate, when sixty subscribers should be secured. This time the response was better. In May, 1882, the exchange was opened.

The report of the Chamber for the year 1882 makes no mention of the telephone. The next year, however, it chronicles the satisfactory operation of the exchange and continues with an account of an interview between a delegation of leading business men and the minister in charge of the department.² The former promised 83 additional subscribers if the rate were further reduced by 37.5 %. The minister replied that such a reduction was out of the question, but promised to reduce the rate by 12.5 %. The new rate went into effect January 1, 1884. Stuttgart then had the cheapest service in Germany.

Stuttgart is the only important commercial city in Wurtemberg. As late as 1905 no other city had a population of 50,000. The extension of exchange service was therefore slow. In 1883 an exchange was opened in Cannstatt, near Stuttgart, and toll-connection established between the two cities.³ Public pay-stations were opened in both cities to enable non-subscribers to make use of the service. In 1886 an exchange was opened in Heilbronn and toll-service established with Stuttgart, and in the following year the

¹ HGK Stuttgart, 1881, p. 10. The business year 1881 ended June 30, 1882.

² HGK Stuttgart, 1883, p. 99.

³ *Verwaltungsbericht* (Wurtemberg), 1883-84, p. 74.

same was done in Ulm.¹ Thereafter the extension of exchange-service became more rapid, four new exchanges being opened in 1888.² The construction of toll-lines kept pace with the extension of exchange-service, and Stuttgart quickly became the center of a number of radial lines.³

The Wurtemberg telegraph administrators imitated the example of the imperial telegraph authorities with regard to the installation of the telephone in rural telegraph offices. This work, however, did not go on as rapidly as in the imperial telegraph area, for the reason that rural Wurtemberg was already better supplied with telegraph offices of the ordinary kind. By the end of the fiscal year, 1885, however, the number of telegraph offices with telephone operation had reached 34, and in the following year this number was increased to 53.⁴ A number of such lines were built from Stuttgart into the surrounding country towns, where they terminated in public pay stations.⁵ It is interesting to note that this class of service preceded the establishment of local exchange service in these towns.

In their conduct towards the telephone the Wurtemberg telegraph authorities cannot be accused of a lack of enterprise. They certainly did all that was expected of them by the most influential members of the local business world. If the desired concession had been granted to the American telephone company, the service would probably have been inaugurated a few months earlier than it was. Be that as it may, after the first pangs of disappointment at the result of the preliminary canvass, the reports of the local Chamber of Commerce and Industry never once referred to the refusal of the concession with regret.

The other South German telegraph system remaining after 1870 under independent local management was that of Bavaria. The same circumstances that led to the introduction of the telephone by the telegraph authorities in the other parts of Germany brought about a like result there. Without showing the slightest indecision the Bavarian authorities accepted Stephan's interpretation of his

¹ *Verwaltungsbericht* (Wurtemberg), 1887-88, p. III.

² *Ibid.*, 1888-89, p. 86.

⁴ *Verwaltungsbericht*, 1886-87, p. 78.

³ HGK Stuttgart, 1883, p. 99.

⁵ *Ibid.*, 1887-88, p. III.

constitutional powers and duties. No attempts appear ever to have been made by private speculators to establish an exchange system in the Bavarian capital. Indeed, no discussion seems ever to have arisen over the relative merits of the policies of public monopoly and of free competition in the supply of telephone service. The decision of the public authorities was tacitly accepted on all sides. The government was left unquestioned to demonstrate the advantages or disadvantages, as the case might be, of the policy of the public ownership of the means of communication upon which it had embarked a generation earlier. The account of the establishment of the first telephone exchange by the Bavarian authorities is drawn, as in the case of Wurtemberg, from the reports of the Chamber of Commerce and Industry having its seat in the capital city.¹

The Bavarian authorities, though accepting Stephan's theory, failed to display his energy in putting the theory into practice. At the same time that exchange service was inaugurated in other parts of the empire, a movement in favor of the establishment of an exchange in Munich was organized by the local commercial association (*Handelsverein*). Yet a considerable period elapsed before the local telegraph authorities could be induced to imitate the example of their neighbors in the imperial postal areas and in Wurtemberg. At last, July, 1882, a proclamation was issued inviting subscriptions to the proposed exchange system. The commencement of construction was made conditional on the response of at least one hundred subscribers. That number was reached before the end of the month and work was begun at once.

Nevertheless the Chamber of Commerce and Industry was dissatisfied with the progress of the work, and in August sent a petition to the telegraph authorities in which its criticisms of the management of telephone affairs are set forth in full. The slowness of business men to respond to the call for subscriptions was caused in its opinion by the unattractive conditions imposed by the telegraph authorities. The Chamber complained that the rate of

¹ HGK Oberbayern, 1881, pp. 42-56. Munich is situated in the district of Upper Bavaria. The report covers the financial year ending June 30, 1882, and in fact was not published till several months later.

charge, which was three fourths of that in force in the imperial exchange service, was too high, and denounced the long contract period of five years as absurdly unbusinesslike and very detrimental to the progress of telephony. The former complaint will be discussed in a later chapter. It will suffice to observe here that a cardinal maxim of all enterprising business men is never to lose an opportunity of expressing a wish for lower rates. The other complaint had more justification. One of the essential characteristics of true enterprise is the willingness to bear all the reasonable risks of the undertaking. There must, however, be some security against capricious demands for service. In order to guard against the danger that subscribers to a new business venture will change their minds and leave the management with a quantity of unmortized but abandoned plant on their hands, charges for service at first must be so fixed as to leave a good margin above the cost of service. This serves as a sort of insurance against unexpected disfavor on the part of the public. If the charge for the service is exceptionally low, a long contract period is not an unreasonable measure of protection. The insistence upon a period as long as five years, nevertheless, lays the management open to a charge of unduly discouraging the subscriptions of many sincerely sceptical members of the public.

The telegraph authorities, however, adhered for the time being to this condition. As regards a number of minor points, on the other hand, they acceded to the wishes of their petitioners. The fee for forwarding telephone messages by telegraph was reduced and the area of delivery was extended throughout the entire telegraph system. Telephones were installed in all the state freight sheds and dépôts and public pay stations in the same places, as well as in all post and telegraph offices.¹ In its report for the following year the Chamber expressed itself without reserve as well pleased with the businesslike attitude the telegraph authorities had adopted and referred especially to the pains they had taken to teach the public the proper use of the system. In fact, they had granted the use of the service to all subscribers as fast as connected, free of charge until the official opening of the exchange on May 1,

¹ HGK Oberbayern, 1882, pp. 88-93.

1883. There was then a total of 145 subscribers. A rehearsal of their leading occupations is interesting as a commentary on the nature of the demand for telephone service at that time. At the head of the list were the bankers and brokers, 33 in number; next in order were the wholesale merchants and the brewers with 7 each; no other occupations had more than one or two representatives; and no less than 60 connections were used for official purposes by the state and municipal authorities.

The report of the Chamber of Commerce and Industry for 1883 was enthusiastic over the extension of the exchange.¹ It praised highly the businesslike methods of the management, and expressed a special satisfaction at the system of private branch exchanges which had been introduced, by which large users with several instruments could make connections on their own premises for purely domestic conversations. In 1884 the Chamber found fault because technical difficulties had compelled the administration temporarily to retard the further expansion of the system.² In the following year, however, everything was once more all that could be desired.³ In 1886 there was the same report.⁴

Meanwhile other cities were beginning to recognize the existence of a need for telephone exchange service. Munich, as the capital and largest city in Bavaria, was the first to demand and to receive an exchange. But in the northern part of the kingdom, Nuremberg was a prosperous city of rapidly increasing industrial importance and could not long be expected to dispense with a similar convenience. Apparently it found no difficulty in obtaining the establishment of an exchange when wanted. The reports of the Chamber of Commerce and Industry which has its seat in that city contained no mention of the telephone until 1886. Then, for the first time, there is a cursory reference to the telephone service which shows the exchange to have been already established.⁵ The reasonable inference is that the response of the telegraph authori-

¹ HGK Oberbayern, 1883, pp. 102-103.

² *Ibid.*, 1884, pp. 92-93.

³ *Ibid.*, 1885, p. 72. "Die Telephonanlage in München ist in erfreulichen Fortschritten begriffen."

⁴ *Ibid.*, 1886, pp. 107-110.

⁵ HGK Mittelfranken, 1886, p. 73. Nuremberg is situated in the district of Middle Franconia.

ties to the request of the local business men for a telephone exchange service was so prompt and energetic that the whole affair seemed too unimportant to be mentioned in a report. Exchanges were established in the other cities of commercial importance in the same quiet way. In 1886 the existence of an exchange in Augsburg is made evident by a cursory reference in the report of the chamber having its seat in that city.¹

At the same time reference was made to the long-distance service between Augsburg and Munich. The establishment of the two kinds of service was apparently synchronous. In that case Bavaria was one year behind the rest of Germany in the establishment of long-distance service. In regard to local exchange service Bavaria was slower. The first exchange was not officially opened until two years after the inauguration of such service by Stephan, and for another period of two years that was the only exchange to be established on the initiative of the Bavarian authorities.² As late as the year 1890 there were only thirteen exchanges in all Bavaria.³ A careful perusal of the reports of the chambers of commerce and industry, however, reveals no feeling of dissatisfaction with the extent of the service or the methods of the administration. If there were not more telephone exchanges in operation the explanation must be either that the service was too dear or that more were not wanted. The former alternative will be discussed in its place. Concerning the latter, it should be borne in mind that Bavaria is one of the most conservative parts of the German Empire, is inhabited largely by an agricultural population, and possesses only a relatively small number of the sort of financial and commercial undertakings which in the early years of telephony were everywhere the principal users of the service.

On the whole the Bavarian telegraph authorities seem to have seized the opportunity presented by the invention of the telephone with as much promptness and energy as the circumstances required. Though they were a trifle slow in making a beginning

¹ HGK Schwaben und Neuberg, 1886, p. 30.

² In 1882 an exchange was established in Ludwigshafen, across the Rhine from Mannheim, in connection with the exchange which Stephan established in the latter city in 1881.

³ *Statistischer Bericht Bayerischer Verkehrsanstalten*, 1890, p. 142.

there was never any general discontent with their conduct of telephone affairs. There was never even the whisper of a suggestion that it would have been better to have left the whole business to private enterprise.

Upon the western border of the German Empire the example of the German telegraph administration had an imitator, the little grand duchy of Luxemburg. The inhabitants of Luxemburg are for the most part a prosperous rural peasantry. The capital is an unpretentious place of some historical interest but of little commercial importance, and the entire population of the grand duchy numbered only 246,455 at the last enumeration. When the early promoters of telephone exchange systems were seeking concessions at the various European capitals and commercial centers, they did not consider the prospects of a remunerative demand for telephone service in Luxemburg bright enough to warrant them in applying for a concession. Hence Luxemburg remained without telephone service for several years. Finally the rulers of the little country, believing that the telephone would fill a real need in bringing its scattered villages into closer connection with the capital, determined to introduce the service on their own responsibility. Accordingly, in 1884, the telephone was declared to be a part of the state telegraph monopoly and by a decree of December 17 of the same year provision was made for the establishment of toll lines and exchange systems.¹

Tarifs tél. I, pp. 67-77.

CHAPTER III

THE DEVELOPMENT OF THE TELEPHONE BUSINESS BY THE TELEGRAPH AUTHORITIES: RELATIONS WITH THE PUBLIC

UNDER a régime of unfettered private enterprise any service that has a prospect of becoming a paying venture will presumably be undertaken at once by some speculative business man. His desire for a profit will stimulate him to create at his own risk the facilities which he judges to be necessary in order to render the service for which he believes he has discovered a need. If his venture does not meet with success, the logical conclusion is that the service, which he proposed to offer, was not so urgently wanted as he expected. In that case the unfortunate, and perhaps also imprudent, business man pays the penalty of his mistake with his fortune, in whole or in part, and the community receives the lesson of his experience for nothing. By the organization of companies with limited liability, an attempt is made to encourage the spirit of business enterprise by dividing the risk, but the principle is the same. The self-interest of individuals is relied upon to supply the community with those services for which it is willing to pay, and to protect it against the establishment of those for which it is unwilling to pay. The individual, by seeking his own profit, promotes that of the community of which he is a part.

This is not the place for the discussion of the rule of *laissez faire* or of the philosophical doctrines on which it is based. It suffices to point out that the German postal authorities had the telegraph business thrust upon them, and then voluntarily assumed the additional trust created by the invention of the telephone. The most important question now is, how have they gone about the task of performing their trust in the interest of the communities they have been called upon to serve?

We already know that they displayed a commendable amount of enterprise in entering upon the telephone business. Yet it is one thing to undertake a new venture and another to carry it to a

successful end. The continuous expansion of the telephone business to keep pace with an ever-growing want, and the continuous differentiation of the service that is supplied in order to keep pace with an ever-increasing diversity of the want, constitute more exhaustive tests of the business capacity of a body of public authorities than does the original establishment of the undertaking. In short, we wish to know what substitute for individual self-interest is provided under a régime of public enterprise as a means of promoting the best interests of a community. To obtain an answer to this question, a digression must be made in order to study the organization of public business management in Germany. Then we can consider the practical operation of that organization with especial reference to the telephone business.

Legally, the telephone business in Germany is conducted by an official of the executive department of the government in the name of the head of the state and in accordance with the constitution and laws. The responsible authority for the conduct of public business under the constitution of 1871 is the Imperial Chancellor. In practice he delegates his functions in large part to subordinates, known as Secretaries of State, who are responsible individually to him for their conduct of affairs. The conduct of the telephone business constitutes a part of the work allotted to the Director of Telegraphs, who since 1876 has been nominally a subordinate of the Postmaster-General, with the title of Under Secretary of State. In fact, his competence over the telegraph and telephone business is not limited by his nominal dependence upon the Postmaster-General. He exercises the powers of the head of an independent business undertaking except so far as his competency is restricted by law, and superintends the actual conduct of operations, subject to the approbation of his master, the Chancellor. Thus the working chief of the German telephone business does not possess the unlimited discretionary power over the conduct of affairs that is enjoyed by the owner of a private business undertaking or to a less extent by the president of a private business corporation. His position as a public official subjects him to a certain measure of control by the sovereign in behalf of which he exercises the powers intrusted to him.

Under the German scheme of imperial government, the executive branch of the government is theoretically responsible to the Reichstag, or imperial house of representatives, for the conduct of such affairs as the postal and telegraph business. But in fact the Reichstag has never framed its rules of procedure with a view to ensuring that responsibility. During the two decades of the personal rule of the "Iron Chancellor," habits of parliamentary practice grew up which have rendered the position of his less masterful successors far less dependent upon the popular will than would be expected from a reading of the constitution itself. The mantle cut for the herculean shoulders of a Bismarck suffices to cover those of his successors and their executive subordinates as well. Annual debates on the budget take place in the German Reichstag as in the legislatures of countries enjoying responsible parliamentary government, but they are incapable of attaining the same importance in Germany as in those other countries. No ordinary minister can be forced out of office as the result of an adverse vote by the popular house. The Chancellor himself must first be vanquished. Consequently criticism in the Reichstag may often be illuminating without being effective. It is not intended that the representatives of the people should enforce the popular will, nor indeed is it admitted that there is any popular will in regard to such matters as the details of the administration of public business undertakings. There is only a conglomerate of more or less important personal and local interests which cannot be expressed as one homogeneous popular will. To leave the representation of these special interests solely to a legislature chosen by universal suffrage would be to confound great political principles with the petty details of business administration. Hence, public obligatory organizations have been created expressly to represent the peculiar interests of the most important economic classes in the community.¹

¹ The only general work on the representation of economic interests is by R. von Kaufmann: *Die Vertretung der wirtschaftlichen Interessen in den Staaten Europas*, 1879. The greatest extension of the public organization of private economic interests has occurred since this book was written. For more recent developments the most valuable sources of information are the articles in the *Handwörterbuch der Staatswissenschaften*, entitled "Handelskammern," "Gewerbekammern," and "Landwirt-

The first chambers of commerce were established in Germany in the commercial cities along the Rhine during the domination of Napoleon.¹ After his empire was disrupted these institutions retained only a local significance, but even so they justified their existence. As the older economic order began to totter and fall in the rest of Germany, the need for some organization of the business men to take the place of the special tradesguilds, which were out of harmony with the rising spirit of business enterprise, began to be felt. Hence sprang up new "mercantile corporations,"² at first dependent in each commercial center upon the more or less voluntary agreement of the local body of merchants among themselves, then gradually recognized by the public authorities and made obligatory by positive legislation. These local associations have never been regulated by imperial legislation, but are required in most of the states of the empire to make written reports at regular intervals to the state authorities. In 1861 a voluntary central organization for the whole of Germany was established to which practically all the chambers belonged. This is the *Deutscher*

schaftskammern." See also, J. Gensel: *Der deutsche Handelstag in seiner Entwicklung und Tätigkeit 1861-1901*, 1902; and Hampke: "Organisationen und Einrichtungen des Handwerks," in the *Handbuch der Wirtschaftskunde Deutschlands*, vol. iv, 1904. The official organs of the three leading economic interests are the periodicals: *Handel und Gewerbe*, since 1888, supplemented by the *Handbuch der Handelskammern*, since 1905; *Der Handwerker* (later the *Deutsche Handwerkerzeitung: Organ des Zentralausschusses der vereinigten Innungsverbände*); and the *Allgemeine Handwerkerzeitung* (formerly the *Allgemeine Handwerkerblatt: Organ des allgem. deutschen Handwerkerbundes*). The agricultural interests are now represented primarily by the *Zeitschrift für Agrarpolitik*, the organ of the Prussian Zentralstelle für Landwirtschaft. The best account of the organization of standing advisory councils for the purpose of keeping the public administrative authorities in touch with the various private economic interests is contained in two articles by Alfred von der Leyen (the editor of the *Archiv für Eisenbahnwesen*) in Schmoller's *Jahrbuch (Jh. für Gesetzgebung, Verwaltung, und Statistik)*: "Die Durchführung des Staatsbahnsystems in Preussen," 1883, and "Die Vertretung der wirtschaftlichen Interessen bei den Eisenbahnen," 1888.

¹ Richard Zeyss: *Die Entstehung der Handelskammern und die Industrie am Niederrhein während der französischen Herrschaft*.

² The word is used in its old sense of an authorized association of merchants. Thus arose, for example, the "Korporation der Kaufmannschaft" in Berlin. The use of the term to designate a stock-company is modern and confined to the United States.

Handelstag, or congress of German commercial associations. A general assembly is held once a year at which political questions affecting the economic interests of the mercantile classes are discussed and arrangements made for concerted action in order to promote their peculiar interests. This organization has commended itself to the German temperament. In consequence the relations between the chambers of commerce and the administrative authorities of the German states and of the empire are close and cordial.

In recent years the theory of the special representation of economic interests has been applied on a wider scale. In the early nineties the long-continued agricultural depression spurred on the public authorities, especially in Prussia, to devise new methods of improving the condition of the rural population. One result of this activity was the creation of agricultural chambers (*Landwirtschaftliche Kammern*). The Prussian law of June 30, 1894, provided for the reorganization of the previously existing voluntary agricultural associations as public representative bodies, supported by a special surtax imposed on the ordinary land-tax, and entrusted with the duty of safeguarding and promoting all agricultural interests in their respective districts. This Prussian example has been followed in a number of other German states. In others, agricultural representation still remains on a private basis.

At this same time the needs of the industrial handicraftsmen were also receiving consideration. The steady progress of the factory system of industry was the source of continuous hard times for this unfortunate class. Many of its members believed their only salvation to be a return to the gild system and a reorganization of *Handwerk* on the basis of control of the local market, so far as the local market for hand-made goods still remained, by the associated masters in each craft. In 1897 a way was found of satisfying this belief without sacrificing any of the fruits of the industrial freedom which is the basis of the modern factory system. The imperial act to reestablish gilds of handicraftsmen (*Reichsinnungsgesetz* of 1897) provided for the establishment of local organizations throughout the empire, which were intended, among

other purposes, to serve the handicraftsmen and small "manufacturers" in the same way as the chambers of commerce already served the big merchants and factory owners. The line between the two classes was not easy to draw. In practice, it was drawn arbitrarily. An industrial undertaking, the income of which is assessed at more than three thousand marks, is usually classed as a factory and its owner assigned to representation in a chamber of commerce, or *Handelskammer*. An establishment yielding a smaller annual net income is classed as a handicraft, and its owner assigned to representation in a chamber of crafts, or *Gewerbekammer*. The proper classification of "storekeepers," especially of small retailers, a class which scarcely existed in the halcyon days of the guilds, gave rise to a great deal of divergence of opinion, and was not permanently settled to anybody's satisfaction. The *Gewerbekammern*, like the *Handelskammern*, have organized an annual congress, known as the *Deutscher Handwerks-und-Gewerbekammertag*.

Last of all has come the question of creating an organization to represent the peculiar economic interests of the laboring classes. Under the German imperial constitution the laboring classes have been able to secure a large political representation without attaining a proportionate political influence. Hence their economic interests are always in danger of receiving less consideration than is accorded to those of the other classes. This is felt by them to constitute a real grievance, which in turn has lent additional force to their political movement. The government has been unwilling to increase their political influence. The alternative is to weaken the foundation of the labor movement by legislation which, by ameliorating the economic situation of the laboring classes, will mitigate their spirit of discontent. The great illustration of this policy is Bismarck's system of compulsory insurance for workingmen. With the same purpose von Bülow's government introduced a bill into the Reichstag in the spring of 1908 to provide for the establishment of chambers of labor (*Arbeitskammern*). These chambers of labor were to be composed of representatives of both labor and capital, and were to have for their object the conciliation of industrial disputes, and the general improvement of the rela-

tions between labor and capital. The laboring classes, however, declared themselves in favor of the erection of chambers of labor composed solely of laboring people, and hotly opposed the government's bill. As the employers opposed it also, the bill had to be withdrawn. It is improbable, however, that the economic interests of the wage earners will long remain without special organized representation.¹

Each of these various local chambers employs a trained secretary or *Syndikus*, usually a university graduate, as a permanent official. He conducts the business of the chamber, and reports once a year to the political authorities of the empire or state, according as the chamber is organized under an imperial or a state law. In Prussia the chambers organized under state law report to the minister of the interior. In the office of the latter the recommendations and complaints are sorted and distributed, each to the branch of the public administration concerned. Thus, for example, all extracts from reports concerning the telephones are sent to the imperial postal and telegraph department. Besides making annual reports to the imperial or state governments, as the case may be, the organized economic interests serve as electoral bodies by which advisory councils are chosen to assist the public authorities in the management of some of the great public business enterprises. The origin of this form of private coöperation in public administration goes back to the first years of the empire.

One result of the Franco-Prussian war was the acquisition of Elsass-Lothringen. At the same time that these provinces became imperial territory the ownership of the French railway lines which had been built therein passed to the imperial government. At first they were administered by the imperial railroad authorities on the ordinary commercial principles. In the fall of 1874, however, the Chamber of Commerce at Mülhausen proposed to the imperial railroad authorities that "instead of conferring about railroad matters from time to time with individual business men, or even with particular public administrations as hitherto had been the practice, in future they should summon representatives of all the chambers of commerce in the territory to regular meetings at

¹ The bill was introduced again in the session of 1909, but was not enacted.

which railroad matters of public interest should be openly discussed." The manager of the imperial railways, von Maybach, promptly accepted this suggestion and arranged to put it into operation at once. He did more. On January 11, 1875, he issued a circular letter recommending all the railroads in Germany to do the same. He recommended further that the representation be not confined to the chambers of commerce, but be extended also to include the agricultural classes. Most of the important lines, however, were then in private hands and nothing of consequence came of von Maybach's suggestion.

Then von Maybach was promoted to the position of Minister of Commerce in Prussia and thereby became in a position to order what he could previously only recommend. He did so by an administrative order issued June 27, 1878; but before this order could be put into execution, Bismarck's great project for the nationalization of the Prussian railways was introduced into the Landtag. In accordance with the report of the legislative commission, the Landtag made its consent to Bismarck's scheme of nationalization conditional on the establishment of an organized representation of economic interests in the management of the state railroads on certain definite principles laid down in the report of the commission. The plan which the government drew up in accordance with these principles failed to meet with the approval of the legislature because, among other reasons, it contemplated a combination of political with economic representation. After prolonged legislative discussion, an act to provide for the establishment of district railway councils (*Bezirkseisenbahnräte*), and of one central council (*Landeseisenbahnrat*) for the whole of Prussia was adopted and went into effect on January 1, 1883.

The political features of the earlier plan were eliminated and the representation of interests was purely economic. This was much more nearly in accord with von Maybach's original scheme, which, by the way, had already been adopted in several of the other German states. In Prussia district councils were organized in each railroad division, containing from twenty to fifty members each. The total number of representatives of the commercial and great industrial interests was 102, of the small industrial and handicraft

interests 77, and of the agricultural interests 110. Members were chosen for three years directly by the local organizations of the various interests. The central council was composed of forty members, thirty chosen by the district councils, twelve representing agriculture and nine each the great and small industrial interests. Ten were appointed by the ministers of commerce, of public works, and of agriculture. This organization has been tried and found useful in Prussian railroad administration. No important change is made in railroad service, especially none in regard to rates, until the representatives of the economic interests have had an opportunity to be heard. These councils have had no connection with the telephones, however, because the Prussian railroads and the imperial telephones are two entirely distinct services. In the imperial telephone service no standing representative councils have been created. When the imperial telephone authorities contemplate an important change in policy, they summon a special meeting of representatives of the economic interests to be affected.

In the two South German States of Bavaria and Wurtemberg, railroads and telegraphs are in the same hands and the same organization serves for both services. The Wurtemberg advisory council, known as the *Beirat der Verkehrsanstalten*, was created in 1878 and reorganized in 1881.¹ It consists of sixteen members, eight representing agriculture and eight representing industry and commerce jointly. The latter were elected, one each, by the eight Wurtemberg chambers of commerce and industry. The elections occur at the same place and time as the triennial election of members of the eight local chambers. The agricultural representatives are chosen at the same time by the members of the so-called *Zentralstelle für die Landwirtschaft*. This is an administrative bureau created in 1877, to represent and promote the interests of the voluntary local agriculture associations.² Meetings of the council are bound to be held at least twice a year. For the speedier transaction of less important business, a standing commission of six members, three representing agriculture and three representing industry and commerce, is chosen from the whole membership of

¹ *Verwaltungsbericht* (Wurtemberg), 1879-80, pp. 1-3; 1881-82, pp. 1-4.

² *Regierungsblatt* (Wurtemberg), 1877, p. 37.

the council. Members of the council receive no pay, serve three years, and are eligible for reelection.

The chambers of commerce and industry themselves were organized in 1874.¹ All persons are eligible to vote for members of the chamber who possess a registered business and are assessed for the business tax in the district. Annual reports are required to be made to the *Zentralstelle für Gewerbe und Handel*, that is, the administrative bureau charged with the duty of promoting the commercial and industrial interests of the kingdom. These reports are divided into two portions. One contains an account of the business activity during the year; the other the complaints or suggestions of individual business men or concerns in matters pertaining to the public administration. The chamber itself usually endorses such of these complaints, or suggestions, as it considers well founded. Thus, if the telephone exchange service in any city is inefficient, or if additional toll lines are needed, a record of that fact is sure to be found in the next annual report of the chamber of commerce and industry for the district in which the complaint has arisen.

As a result of the establishment of separate chambers for handicraftsmen in consequence of the *Reichsinnungsgesetz* of 1897, the chamber of commerce and industry had to be reorganized. In 1899 the appropriate change of title was made, but no restrictions in the qualifications for membership were introduced.² Apparently the handicraftsmen were left to sort themselves voluntarily from the "big fellows." Moreover, the chamber of commerce retained the right to choose the entire representation of the industrial, as well as of the commercial, interests in the railroad council. This deprivation was regarded by the four young chambers of crafts as a grievance.³ They represented, each in its own district, the newly created voluntary and compulsory guilds of handicraftsmen and the Wurtemberg societies of arts and crafts of all sorts. The masters and journeymen of the guilds elected separate representatives. These interests felt they had little in common with the great merchants and factory owners, and objected to intrusting

¹ *Regierungsblatt* (Wurtemberg), 1874, p. 193.

² *Ibid.*, 1899, p. 579.

³ *Jahresbericht der Handwerkskammer* (Stuttgart) für das Jahr 1901. Einleitung.

their economic interests to the tender mercies of their bigger rivals.¹ The chambers of commerce naturally wished no further change in the established order of things, and opposed the request of the chambers of crafts.² They argued that the railroad and postal authorities could secure all the information they required from the existing council, and that the crafts were adequately represented. Moreover, if the latter received special representation, then not only would the chambers of commerce desire a proportionate increase of their representation, but also the apprentices and ordinary wage earners would begin to clamor for representation. Surely enough, this was precisely what happened.³ In 1905 the reorganization of the council was definitely postponed until the question of the establishment of chambers of labor had been definitely settled.

The representation of economic interests in Bavaria is in general like that in Wurtemberg. It is not necessary to go into the details here. The handicraftsmen are still, however, organized in the same chambers with the big commercial interests, but the chambers comprise two separate sections, one for each branch of industry.

Enough has been written to show that German governmental business enterprises are not administered blindly nor in disregard of the wishes of the interests concerned. There is none of the spirit of arbitrary authority so often displayed by American captains of industry and most neatly epitomized by the infamous remark ascribed by tradition to Commodore Vanderbilt, "The public be damned!" The German theory of the organization of monopolistic public services on a large scale under direct public management is broad enough to include a corresponding organization of those portions of the public to whom the service is to be rendered. The degree of success which this theory will obtain in practice depends, largely, on the character of the men to whom is intrusted its execution.

No general observations can convey so accurate an idea of the

¹ See esp. *Jahresbericht der Handwerkskammer* (Stuttgart), 1902, p. 123.

² *Jahresbericht der Handelskammer* (Stuttgart), 1902, p. 223.

³ *Jahresbericht der Handwerkskammer* (Stuttgart), 1904-05, p. 85.

interest displayed by German business men in public trusts of this nature as a brief biographical notice taken from a recent annual report of one of the Bavarian chambers of commerce.¹ The author of the report took the occasion of the death of the chairman of the chamber, Kommerzienrat von Weidert, to give a brief account of his life and public services. He was born in Bavaria in the year 1829, and was a banker by trade. He was elected to the chamber of commerce at its reorganization in 1869 and became its chairman in 1873, in which capacity he served until his death on April 24, 1906. Since 1886 he had been a member of the general committee (*Ausschuss*) and since 1901 of the executive committee (*Vorstand*) of the German Handelstag. He was also chairman of the special committee on commerce of the same organization. He had also been a member of the advisory council to the Bavarian state railroads (*Eisenbahnbeirat*) since 1877, and a member of the permanent German railroad tariff commission since 1876. None of these positions was solely an honorary distinction. They all entailed hard work and made heavy demands upon his time and business capacity. There are many men in Germany like Kommerzienrat von Weidert, and it is to them in no small measure that the success of German methods of business organization, with a view to the coöperation of consumers in the work of administration, must be ascribed.

¹ HGK Oberbayern, 1906.

CHAPTER IV

THE DEVELOPMENT OF THE TELEPHONE BUSINESS BY THE TELEGRAPH AUTHORITIES: WORKING OF THE MACHINERY

WHAT, now, is the working of this machinery for the conduct of public business undertakings and for the representation of economic interests? The simplest way of observing it is to examine a series of reports of chambers of commerce and discover what criticisms they have to make concerning the administration of the public business in their respective districts. As it is the telephone service in particular in which we are interested, we shall confine our inquiry to that branch of the public activity.

In Bavaria, after the establishment of local exchanges in the cities of the foremost commercial importance, the demand for additional telephone facilities took the direction, not of the further establishment of exchanges in smaller cities and in country villages, but of the extension of long-distance service. In 1889 the Chamber of Commerce at Munich reports the receipt of a letter from the Chamber at Ulm, urging the coöperation of the Munich Chamber in order to secure an extension of the long-distance line already running from Munich to Augsburg, on to Ulm.¹ The Chamber at Munich gladly indorsed this request and, at the same time, added one of its own for the establishment of long-distance connection with Frankfort-on-the-Main by way of Nuremberg. In the report of the Chamber at Nuremberg for the same year, precisely the same requests appear, with the emphasis, as one would expect, laid on the last.² This report also refers to the receipt of a request from the Chamber at Frankfort, asking for information in regard to the demand at Nuremberg for long-distance communication with Frankfort. The Chamber at Nuremberg reports that after inquiry fourteen firms had already pledged themselves to use such a line if built, and others would undoubtedly follow. Finally,

¹ HGK Oberbayern, 1889, p. 127.

² HGK Mittelfranken, 1889, p. 35.

in the report of the Chamber having its seat at Augsburg the same requests once more appear.¹

Turning to the report of the Chamber at Stuttgart for 1890, we find that the Wurtemberg authorities had already constructed a line from Stuttgart to Ulm, and were only awaiting the completion of the section from Ulm to Augsburg by the Bavarian authorities, to open direct long-distance connection between Stuttgart and Munich.² At the same time the Stuttgart report noted the receipt of a request from the Chamber at Frankfort asking for information in regard to the demand at Stuttgart for long-distance connection with Frankfort. The Chamber at Frankfort sent word that the imperial telephone authorities required a guarantee of receipts amounting to 8,000 marks per year at the rate of 1 mark per message before they would construct their share of the long-distance line between the two cities, and that 6,000 marks had already been pledged at Frankfort. The Chamber at Stuttgart at once turned to the local stockbrokers' association (*Börsenverein*) and the latter quickly raised pledges amounting to 4,000 marks, the sum required by the Wurtemberg administration as the requirement for the construction of its portion of the proposed line. The Chamber at Stuttgart then replied to Frankfort that a local need for the proposed line was found to exist and that the Wurtemberg authorities were prepared to satisfy the need.

The extracts from the reports quoted above suffice to show the methods employed by the chambers to secure the facilities they wanted. By correspondence among themselves they were able to bring concerted pressure to bear upon the telephone authorities at the same time that they displayed the evidence of the existence of a want. The telephone authorities, on their side, protected themselves against unreasonable demands by the requirement of a guaranteed minimum income from each separate facility supplied. If there were no such safeguard the administration would be swamped with demands for service sent in by over-sanguine and irresponsible persons. It could not meet them all at once, and it would have no means of sifting the well founded from the capri-

¹ HGK Schwaben und Neuburg, 1889, p. 40.

² HGK Stuttgart, 1890, pp. 53-54.

cious demands. The purpose of the guarantee should be simply to make certain that demands for service were founded on a genuine want. But it would be a mistaken policy to shift all the risks of extensions to the shoulders of the users. It is a part of the function of business management to bear these risks; it should not endeavor to shift them, but only to reduce them to a minimum by any means that makes more certain the accurate adjustment of supply to demand. If the requirement of a moderate guarantee will do this, it is a commendable administrative device. In short, the system is a justifiable one and, provided the requirements are not set too high, should work well.

In Bavaria and Wurtemberg there was never the least complaint on this score. By searching the annual reports succeeding those in which were made the requests previously quoted, the results of the requests can be discovered. The request for a line between Augsburg and Ulm to complete the Munich-Stuttgart circuit is not repeated. In the report of the Chamber at Munich for 1892, there is an allusion to the line which shows it to be already in operation.¹ The report for the following year contains a reference to the line running through Nuremberg to Frankfort. There had been no repetition of the original request for that line. Hence, we may infer that it also was constructed by the telephone authorities with satisfactory despatch. In the same year, however, there is a record of the failure to secure a long-distance line to Berlin by way of Leipsic.² The Bavarian authorities built the line from Bavaria to the frontier, but there it stopped. The imperial telephone authorities declined to assume the risk of constructing their part of the line. The Munich Chamber took the occasion to express its appreciation of the readiness of the Bavarian authorities to respond to the wishes of the public.

Turning to the reports of the Stuttgart Chamber we find the same satisfaction with the Wurtemberg telephone administration. The methods of the imperial authorities, however, gave rise to a complaint. The desired long-distance connection with Frankfort, although approved by the former, had been rejected by the latter.³

¹ HGK Oberbayern, 1892, p. 94.

³ HGK Stuttgart, 1891, p. 41.

² *Ibid.*, 1893, p. 86.

The ground for their refusal to install the line was that there was no general need for it, only a special need confined to certain limited circles. The Stuttgart Chamber was somewhat irritated because this was not the first time that the imperial authorities had been less responsive to requests for new construction than their own Wurtemberg authorities had been. In 1888 the city of Gmünd, in which an exchange service had just been established, desired a toll connection with the neighboring city of Pforzheim in Baden, which forms part of the imperial postal area.¹ The imperial authorities demanded a guarantee of 2,000 messages per annum at 1 mark each. At the same time the Wurtemberg authorities offered to install a longer line to connect Gmünd with Stuttgart at a cheaper message rate and without requiring any guarantee. The latter connection was, of course, made. Then the imperial authorities reduced their requirement by half. This more moderate guarantee the commercial interests of Gmünd felt able to undertake. The impression remains, however, that the imperial authorities were setting their requirements too high.

In the year 1890 an examination of all the current reports of chambers of commerce was made with a view to ascertaining the general feeling in regard to the policy of the imperial telephone administration.² Out of 112 reports examined, 80 dealt specifically with the telephone. All sorts of complaints and suggestions for improving the service were of course found. The predominant cause for discontent, however, was the difficulty in securing long-distance lines. Not all of the complaints in this regard were well founded. Van der Borcht reports that it was not surprising that many of the proposals for extensions or for new lines were not accepted. Still the fact remained, according to Van der Borcht, that in almost all cases requirements were imposed by the telephone authorities which could be explained only by a fundamental repugnance towards a rapidly increasing utilization of the telephone for long-distance communications. The petitioners for new

¹ HGK Stuttgart, 1888, p. 69.

² R. van der Borcht: "Die Tätigkeit der deutschen Handelskammern in Bezug auf das Fernsprechwesen im Jahre 1889." *Jahrbuch für National-Oekonomie und Statistik*, vol. 56 (1890), pp. 412-24.

lines were required to guarantee that the annual receipts from the operation of the desired lines should not be less than a stipulated sum during a certain period after the establishment of the lines, — usually five years.

In many cases these guarantees could not be provided because the sum was too high in comparison with the business in sight. But when the guarantees were declined the telephone authorities decided that there was no general need for the desired facility. Occasionally other conditions were attached which made the acceptance of the guarantee even more difficult. Thus when the city of Siegan wished to be connected with the Rhenish Westphalian territorial telephone system, it was required not only to guarantee an income of 15,000 marks for five years from the operation of the connecting line, but also to make a considerable contribution to the cost of construction. These conditions were declined by the local chamber of commerce on the ground that they were too onerous. Such, indeed, in the opinion of the local interests, was not infrequently the nature of the conditions imposed by the telephone authorities. The result was that the desired facilities were not constructed.

When remonstrances were addressed to the telephone authorities by the representatives of the interests affected, the reply was that for purposes of long-distance communication, not the telephone but the telegraph was primarily to be employed. Only where the telegraph service was no longer adequate to the demands made upon it should additional facilities be provided in the shape of a long-distance telephone service.¹ This attitude towards the long-distance telephone seemed a hardship to the chambers of commerce. Prompted by fear lest the revenues from the telegraph should be diminished by the competition of the telephone, the public authorities, instead of building telephone lines at their own risk or subsidizing private enterprise to take the risk for them, as was the practice in some enterprises, were requiring private enterprise to subsidize the government. Such was the burden of the complaint of the chambers of commerce as summed up by Van der

¹ Van der Borcht, p. 423. Quoted from a letter addressed to the Chamber of Commerce at Frankfort, May 12, 1890, by the imperial telegraph authorities.

Borcht. Both the Chamber at Frankfort and that at Dresden complained that had private enterprise been allowed free play in the telephone business, a more rapid development would have taken place in Germany.

These complaints should be read between the lines; taken literally, they are calculated to convey a false impression. Under the German system of governmental business management, the interests of consumers are intended to be safeguarded by the organization of public criticism. In their annual reports and at their annual conventions, chambers of commerce, professional associations, agricultural societies, and other organs of public opinion, are expected to make known to the public authorities not only their unsatisfied wants but also any grounds for discontent with the administration of public affairs. Such criticism is expected to be, and usually is, well considered and temperate. The organization of public criticism should do away with the license and abuse that so often accompany irresponsible criticism of public authorities. On the other hand it should safeguard the liberty of a strong and vigorous expression of opinion. When a chamber of commerce fails to obtain an extension of telephone facilities to which it believes itself to be entitled, its duty is to register a vigorous complaint. That is the legitimate procedure for the promotion of local interests. Where a number of chambers of commerce find their plans for local improvements along a certain line balked by the refusal of the public authorities to accede to their requests, they are bound to make common cause with one another. That incidentally thereto they should exaggerate the extent of their grievance is simply an ordinary manifestation of human nature.

In fact, the requirement of guarantees by the telephone authorities did not prevent the construction of as many really necessary long-distance telephone lines as might be supposed from the amount of complaint. Out of thirty-two toll lines, for which at this time guarantees were demanded and accepted, in only thirteen cases were the guarantors required to make up a deficiency. All of these lines were of secondary or purely local interest. In no case did the telephone authorities demand more than was actually

earned from an important long-distance connection.¹ It is not unreasonable to suppose that local authorities were inclined to be unduly optimistic when it was a question of predicting the need for additional service. Indeed, since there was no other way of securing additional service than by applying for it, not to have preferred to err in the direction of excessive optimism would have been a mistaken policy.

Yet where there was so much smoke, there must have been some fire. The telephone was able to cause considerable damage to the public investment in telegraphs. There can be no doubt that the effect of the competition of the long-distance telephone with the telegraph was to take away business, at first from lines connecting neighboring cities, and then, as the long-distance telephone service developed, from those connecting places that were more remote. Thus, the internal telegraph traffic began to show the effects of competition during the eighties in small countries like Belgium, Holland, and Switzerland, and in larger countries the telegraph business was driven to cover under the protection of the greater distances. Thus, in the imperial postal area, the number of internal telegrams has regularly increased, except for a slight relapse during the industrial depression of 1901-1902, but in the Bavarian and Wurtemberg services, the domestic telegraph business has been unable to hold its own. The number of paid domestic telegrams in Wurtemberg in 1880 was 233,000; it reached the maximum in 1898 at 325,000; and declined in 1906 to 191,000. The loss, however, was more than compensated for by the growth of the external and transit traffic. In Bavaria the same condition exists. If the telephone lines are made available as fast as demanded, regardless of the disuse of the existing telegraphs, the effect will be the destruction of a part of the utility of the telegraph plant, and a reduction of the value of the government's investment in that undertaking. Consequently the public authorities have had a strong incentive to substitute the long-distance telephone for the telegraph no more rapidly than is required in the ordinary course of maintenance or extension of the original plant.

¹ *Drucksachen des Reichstages*, Session 1889-90; 6. Anlageband, Nr. 676, appendices 5 and 6.

They may do this in either of two ways: they may refuse to introduce the alternative service more rapidly than is necessary to keep pace with the growth of the total demand for the service under consideration; or they may introduce the alternative service as rapidly as that particular kind of service is demanded and charge a price for it sufficiently high to compensate them for the depreciation of the older investment. In the former case the superior service comes into use more slowly; in the latter, the consumer pays extra in order to have it available at once; in either case, the public investment is protected against loss. Under a régime of private enterprise, theoretically the competition between the older and the newer service will automatically assign to each its proper share of the public patronage. Any losses will be borne not by the consumer but by the owner of the service which falls into disfavor. In practice this result is liable to be forestalled by mutual agreement between the owners of the rival services. In so far as the services concerned can only be rendered advantageously to the public on so large a scale as to render the freedom of competition illusory, such mutual agreement is not only liable, but very likely, to occur. In that event a condition is produced in no wise different from that under public ownership. The problem at once arises how to provide a substitute for competition in order to produce the maximum of public satisfaction. The solution must lie between private ownership under regulation and public ownership combined with administrative organization.

h This is a matter that must be considered in the final summing up of the advantages and disadvantages of public as compared with private ownership of monopolistic business undertakings. It should be observed, however, that the attitude of the telegraph authorities was not arbitrary or capricious, but based on definite principles of public policy which they did not hesitate to avow.

This policy was harshly criticised at the time by Van der Borgh. Again in his book on transportation, published a few years later, he denounced it as based on an unsound theory of finance.¹ After another dozen years, however, he had modified his opinion. In his article on telephones in Elster's *Wörterbuch* he observes: "The

¹ R. Van der Borgh: *Das Verkehrswesen*, 1894, pp. 392-94.

demand that special interests should guarantee a minimum income, or furnish contributions to the costs of construction, is, under certain conditions, unavoidable.”¹ As a matter of fact, the imperial telephone authorities seem to have adhered to their policy of introducing the long-distance telephone service on the basis of local guarantees until all the main telegraph lines had been paralleled by the long-distance telephone. Thereafter the question of competition between the two could no longer arise in the old form, for no attempt would be made to compel users of an overloaded telephone line to go back to the use of the telegraph. Further increases of facilities for long-distance communication were made in whichever shape, telegraph or long-distance telephone, was desired by the prospective users of the service.² Thus, in consequence of the natural growth of the service, criticism of the administration's policy of extensions was completely disarmed.

Turning to a number of the recent reports chosen purely at random, we find no dissatisfaction with the methods of the imperial telephone authorities in ascertaining and satisfying the need for increased long-distance telephone facilities. In 1900 the Chamber at Stuttgart noted the receipt of a communication from the Chamber at Wiesbaden urging its coöperation in supporting its proposal for direct long-distance connection by telephone between the two cities. To the Chamber at Stuttgart, however, it seemed questionable whether there was sufficient demand for such a service in Stuttgart, and it replied to the communication to that effect. Nevertheless, Wiesbaden felt a need for the service, and a line was constructed by the imperial telephone authorities during the course of the year.³

The Chamber at Mannheim, in its report for 1906,⁴ expresses its pleasure at the increase of long-distance facilities during the preceding year, and sets forth its request for extensions of service

¹ *Wörterbuch der Volkswirtschaft*, 2d edit., 1906; Art., “Das Fernsprechwesen.”

² HGK Stuttgart, 1895, p. 150. The report quotes from Stephan's speech at the annual meeting of the Elektrotechnischer Verein in the fall of 1894, in which he declared that the further extension of the long-distance telephone system would not be retarded in the interest of the telegraphs. The Stuttgart-Frankfort line was constructed during the course of the same year.

³ HGK Stuttgart, 1900, p. 43.

⁴ Part I, p. 356.

during the coming year in a calm and business-like manner. The Chamber at Dresden, in its report for 1903,¹ touches on the telephone service, but has no complaints to make. In the following year,² there is still no complaint of inadequate or inefficient service, but on the contrary the tone of the report is one of complete satisfaction with the methods of the telephone authorities.

The Chamber at Bremen reports in 1901³ that the telephone service is generally satisfactory and that the management displays a gratifying desire to meet the wants of the city. The report adds that a direct long-distance line to Leipzig in place of the existing indirect connection would be much appreciated. The report for the following year⁴ notes that the construction of a direct line to Leipzig has been approved, but that of one to Antwerp has been declined. In the annual report for 1903⁵ the Bremen Chamber remarks: "During the past year the Chamber has attempted to secure the improvement of the telegraph and telephone connections with a number of foreign commercial centers (referring especially to Antwerp and Rotterdam). The Chamber has always met with a most gratifying responsiveness on the part of the imperial postal authorities, to whom we take this occasion to express our sincere thanks." In 1904⁶ the report of the Chamber echoed the same sentiments, chronicled the increase of facilities that had been made during the year, and expressed its desire for more.

As an illustration of the coöperation between the telephone authorities and the local interests, the following notice from the report of the Chamber at Munich for 1905⁷ may be cited: "On the 6th October the royal postal authorities for the district sent us a request asking in what places a need existed for the opening of telephonic communication with Switzerland." The Chamber took pains to send back a thoroughly reliable reply. Earlier in the same year a similar request was made for information concerning new facilities that were desired for communication between Munich and the grand duchy of Hessen. The Chamber

¹ Part I, p. 54.

² Part I, p. 45.

³ P. 76.

⁴ P. 80.

⁵ P. 87.

⁶ Pp. 84-89.

⁷ P. 96.

replied that it could not point to the existence of any need, but would, of course, welcome any new lines.

In a few places the reports breathe a slight spirit of impatience at the delays in making additional facilities available. Thus Essen, the center of the great Rhenish Westphalian coal district and the seat of the main Krupp steel works, reports in 1904 ¹ a gratifying increase in telephone facilities during the year, but is obliged to reiterate a previous request for a better service with Hamburg. In 1905 ² the Chamber complained that the service with Hamburg had not been sufficiently improved and that the entire toll service throughout the coal district was overburdened. The Chamber recognized the attempts the telephone authorities had made to relieve the congestion, but insisted that a more vigorous creation of new lines was indispensable in order to keep pace with the rapidly extending demands for telephone toll service. In 1906 ³ the report chronicles the opening of fresh lines and expresses the hope that the previous congestion will be relieved by the increased rate of fresh construction during the preceding year. The only positive request is for more lines to connect with Rotterdam. On the whole the report still smacks a bit of impatience. The reports of Krefeld, however, a city on the edge of the same district, and the center of the silk manufacture, for the years 1901-1904 are characterized by an unruffled spirit of contentment with the conduct of affairs by the telephone authorities. In Hanover ⁴ the long-distance lines towards the west, that is, towards the Rhenish Westphalian coal district, were also reported at this juncture to be overcrowded, to the annoyance of business men. The telephone authorities replied that the cause of the trouble was the enormous and wholly unanticipated increase of long-distance telephone traffic in the last few years in that district, which had wholly outstripped the provision made in advance. The authorities promised to install a new line to Essen at once, although not provided for in the budget, and although a new line to Elberfeld had already been constructed in that same year. A delegation from the Chamber visited the local exchange in order to see what was the foundation for the com-

¹ Part I, pp. 33-35.

² Part I, p. 44.

³ Part I, pp. 42-43.

⁴ HGK Hanover, 1905, p. 68.

plaints of poor service that were made by business men and, after a courteous reception by the local officials, reported themselves as entirely satisfied with the methods of conducting the business. So we might go on. In no case do the reports condemn the methods of the imperial telephone authorities, or so much as hint at a wish for the surrender of the telephone business to private enterprise.

The policy of the German telephone authorities with regard to the establishment of new exchanges never gave rise to the same difficulties as occurred in the case of the long-distance lines. The experience gained from the first year's operation of the earliest exchanges seemed at the time to show that an independent exchange system would pay its way at the existing level of rates, provided that thirty-six subscribers were connected.¹ But the experience of a very few more years of operation showed that the certain increase of the exchange systems warranted their establishment with a much smaller number of subscribers. Hence, during the first decade after the introduction of the telephone, the policy of constructing new exchanges, first, in the important commercial centers, and then in those of more modest pretensions, was vigorously pressed by the German telephone administration. In the next decade this activity was extended from the medium-sized to the smaller sort of cities. In general, the question of establishing a new exchange when desired by the local business interests gave no trouble.

In Bavaria, at this period in the development of the industry, the telephone authorities seem usually to have required that ten persons should signify their intention of joining the system before the government would assume the responsibility for the undertaking. In 1897 the small rural city of Weissenburg applied for the establishment of an exchange and was refused on the ground that it was not possible to secure ten subscribers to the proposed service.² There were only six persons who desired to be connected. The chamber of commerce for the district urged the telephone authorities to reconsider their decision, especially as there was a demand for long-distance service between Weissenburg and the commercial center of that district, Nuremberg. This request ap-

¹ HGK Stuttgart, 1887, p. 85.

² HGK Mittelfranken, 1897, p. 38.

pears to have been complied with at once, for it is not repeated in the report for the following year. The later policy of Bavaria in this respect has been to construct rural toll lines and set up switchboards at their terminals, whenever such installations were applied for. Any rural village authority which considered that it was unjustly treated, could of course secure a private line, like any private persons. There is no evidence, however, that the judgment of the telephone administration has ever been seriously challenged during the last decade.

In the year 1900, the average number of persons connected with exchanges in places in the imperial telephone area having less than 2,000 inhabitants was six.¹ Indeed, the energetic use of the telephone as a substitute for the telegraph in order to connect outlying villages with the general telegraph system of the empire, anticipated the local demand of the rural communities for a special telephone service. When that demand later arose it did not manifest itself at first in the form of a general desire for local exchange service, but in that of a special desire for private connections with the long-distance service. Hence it was easy to readjust the existing facilities to the altered situation. Scattered individuals, such as big landowners and the managers of brick-yards and quarries and other concerns of a similar sort, first began to feel this need. They were able to satisfy it by erecting a private wire between their residence or place of business and the nearest telegraph station or branch telephone line. As soon as it came to pass that several such private wires converged at a common terminal, the transition to an exchange was a simple matter. In other cases where the erection of a number of such private wires was simultaneously under consideration, the conversion of the project into one for the establishment of a public exchange service was equally simple. The problem was one not of administrative policy but of rates.

In Wurtemberg the process of the development of rural telegraph offices operated by telephone into genuine telephone exchanges may be clearly traced. In 1892 there were 572 telegraph offices in Wurtemberg, an increase of 50% since 1880. There was

¹ *Ergebnisse R. P. T.*, 1896-1900.

one office for each $12\frac{1}{2}$ square miles of territory and one for each 3,560 inhabitants. Of these 179 were operated by telephone. At the same time, there were eight telephone exchange systems in operation, with which 25 public call offices were connected, situated partly within the urban limits and partly within neighboring villages. Two thirds of the number of telephone stations actually in use were in Stuttgart itself.¹ The year before, a number of the rural telegraph offices operated by telephone were experimentally opened to the direct use of the public, in order that the country villagers might consult with their physicians in the next large town and deliver important messages of all sorts more easily than by ordinary telephonic telegraphs.² This arrangement proved satisfactory and was extended. The next step was to permit any villager who had a special need for such toll communications to connect himself with any telegraph office operated by telephone by a special wire, in order to have more convenient access to the toll line and at the same time to enjoy unlimited communication with all others similarly connected to the same terminal at the ordinary flat rate. This practice was officially regulated in 1899.³ All such offices were thereafter to be connected with the general long-distance telephone system of the kingdom. In 1902 all rural telegraph offices operated by telephone to which no special subscribers' lines were connected, and situated within five kilometers of an exchange system, were declared to be public call offices in connection with that system.⁴ There were 675 of these offices at that time. A year later the total number of telegraph offices in Wurtemberg was 1,250, of which 862 were equipped only with telephone instruments and hence had been transformed into public call offices in connection with the general telephone system of the state. Messages, of course, could be delivered from these stations like ordinary telegrams as well as be received for transmission elsewhere. In 1904 the term "telegraph office" was abolished for these offices, and they became thereafter either public call offices or, if they were the terminals of special subscribers' lines, exchanges. In the fol-

¹ Verwaltungsbericht (Wurtemberg), 1891-92, p. 71.

² *Ibid.*, 1890-91, p. 71.

⁴ *Ibid.*, 1901-02, p. 78.

³ *Ibid.*, 1898-99, p. 84.

lowing year, of 1418 places in Wurtemberg connected with the general telephone system, 413 possessed exchange offices and 1,005 call offices. Of the latter 982 were combined with postal or genuine telegraph offices. There was practically no hamlet so small as not to be within easy telephonic communication with all parts of the land. The same policy has been pursued in Bavaria and in the rest of Germany.

This expansion of the service in the rural districts provides admirably for the greater part of the wants of the rural population. Their primary need is not for a local exchange service, but for connection with the nearest city and with the outer world in general. So far as there is a demand for a local exchange service it can be easily supplied by building upon the existing basis. The extent to which this secondary demand will be satisfied is thus reduced to a question of rates. The exchange service in the rural communities, however, would scarcely be worth having at all, except for the connections with the neighboring urban exchanges, or, as it is usually called in America, the toll service. The centralized management of the telephone business in Germany, its operation on a large scale and in conjunction with the general postal and telegraphic business, all things considered, have accomplished more for the extension of the telephone service into the rural districts than would have been possible under any system of private competition or purely local initiative.

In the long run, so far as concerns the quantitative adjustment of supply to demand, the German system of a special representation of economic interests, and their coöperation with the public authorities in the management of business undertakings, has worked well. It has kept the public authorities in close touch with consumers. It has enabled them to estimate quickly and accurately the future demand for a service and thus has enabled them to maintain an adequate supply. The system indeed has accomplished more than this. It has furnished a recognized vehicle by means of which originators of innovations of all kinds in the operation of public undertakings, inventors who wish to secure the adoption of their devices, promoters who desire to find a sale for their products, ordinary business men who desire to make suggestions concerning

the conduct of public affairs, all can bring their ideas to the notice, not only of the authorities, but also of those interests most likely to be affected. Thus the organizations of economic interests have an educational as well as an administrative value. To this agency the German public trusts not only to get what it wants, but also to learn what it ought to want. The organized coöperation of the private citizen in the work of public administration is in Germany a fundamental principle of public ownership. It is a principle the operation of which we shall proceed to trace further.

CHAPTER V

THE DEVELOPMENT OF THE TELEPHONE BUSINESS BY THE TELE- GRAPH AUTHORITIES: TECHNICAL PROGRESS

A COMMON objection to the public ownership of business undertakings is that such ownership tends to prevent industrial progress. Under a régime of free competition, the desire of each business man to secure the greatest possible profit incites him to introduce with all speed new kinds of tools which give promise of enabling him to put his product upon the market more cheaply than can his rivals. Under a régime of private monopoly, the fear of competitors loses its force as a motive impelling to economy, but the desire of the owners of the monopoly to secure the greatest possible profit remains unchanged. Monopoly, as well as competitive, profits can be most easily enhanced by the introduction of improvements that cheapen the process of production.

Under a régime of public ownership, however, the managers of an undertaking have no pecuniary interest in the results of increased economy of operation. The benefits of improvements in the instruments of production accrue to others. To be sure, most men of the ability to conduct the operations of a great business undertaking will be prompted by their own self-esteem, and by the pleasure which any good workman, whether he works with his hands or with his brain, takes in doing the work of his choice as well as he can, to manage the public affairs with which they are intrusted as economically and as efficiently as they can. Nevertheless, this motive can hardly be expected to lead to such vigorous and aggressive conduct as is produced by the operation of the more powerful motive of self-interest. The desire of consumers to secure the satisfaction of their wants as cheaply as possible must be utilized in some way to fill the void created by the elimination of the self-interest of the managers of the undertaking. Otherwise the security for industrial progress afforded by that motive would appear to be seriously impaired.

In fact we find that industrial improvements are made under a régime of public ownership. For example, the technical progress of the German imperial telephone system from the first has been continuous and important. One of the first tasks of the early telephone engineers was to devise a satisfactory calling apparatus. The style originally employed in Germany seems to have been a sort of mechanical whistle attached to the telephone instrument. In 1885 these were replaced by electrical call signals actuated by chemical batteries of the so-called wet variety, one for each calling apparatus. In 1891 these in turn began to be replaced by dry batteries.¹ Soon, however, these local batteries gave way for calling purposes to the magneto. The change was completed in Berlin, Hamburg, and Cologne in 1895, and within a few years in all the leading commercial centers.² Finally the magneto calling apparatus and local source of energy for speaking purposes have both given way to the so-called common battery system of operation.³ In each case the effect of the change has been an economy in operation or an increase of efficiency. Usually the change has brought about an improvement in both directions.

In most of these cases, however, the introduction has been easy for the telephone authorities. The instrument displaced has been one which quickly wore out and must have been replaced by another of the same kind if a better kind had not been invented. Moreover, the rapid growth of the telephone business, and consequent perpetual necessity for fresh construction, has facilitated the introduction of the latest appliances. Indeed, it is probably easier for well-trained engineers in the service of the government, impelled as they are by their professional pride and *esprit de corps*, to keep fresh construction abreast of current technical progress than not to do so.

Opponents of the policy of public ownership of business undertakings sometimes assert that nevertheless the tendency of such undertakings is to hinder industrial progress because they offer no adequate stimulus to invention. Thus a modern French oppon-

¹ *Ergebnisse RPT*, 1891-95, p. 55. These official reports are particularly valuable for the purpose of illustrating the technical progress of the telephones.

² *Ibid.*, 1896-1900.

³ *Ibid.*, 1901-05.

ent, Paul Leroy-Beaulieu, after alluding to the work of the great inventors and men of science of the nineteenth century, observes:¹ "The State on the contrary invents nothing." This is, of course, true. It is equally true that private business corporations invent nothing. Inventions are the inexplicable products of human ingenuity. If there were no opportunity for the remunerative exploitation of these products of human ingenuity, and consequently no incentive to appeal to the self-interest of inventors, it is probable that inventions would nevertheless continue to be made. Perhaps not so many men of an inventive turn of mind would sacrifice their health in the pursuit of fortune, but few would deny themselves the pleasure of exercising their inventive faculties. The maintenance of the supply of inventions would be insured not only by the *amour propre* of the individual, but also by the very nature of the inventive faculty itself.

The important matter from the point of view of the public is to make suitable arrangements for the testing and proper application of the really valuable inventions. Under the régime of free competition this is provided for automatically by the play of private enterprise. If an inventor has hit upon a valuable idea he should have no difficulty in obtaining financial backing and thus in being enabled to put his invention before the public. The public will then determine by means of the automatic operation of the ordinary forces of demand and supply the reward which the promoters of the invention are to receive for the work they have performed and the risks they have undertaken. The desire for this reward insures the testing and proper application of the really valuable inventions.

Under a régime of monopoly it is not practicable to employ this rough and ready method of threshing the wheat from the chaff. The policy of granting special concessions, authorizing private enterprise to exploit an invention for a limited period of time, is open to the objection that it violates the principle of monopoly. For example, it is absurd to organize innumerable stock companies and to establish innumerable rival telegraph systems in order to ascertain the comparative merits of the devices for increasing

¹ *L'état moderne et ses fonctions*, 3rd edit., 1900, p. 49.

the speed of telegraphy, which are associated with the names of Wheatstone, Murray, Pollak and Virag, Siemens and Halske, Meyer, Baudot, Mercadier, Rowland and Delany, to say nothing of the divers other similar contrivances, already born or about to be born from the fertile brains of our inventive geniuses. There is no alternative but to substitute for the principle of competition that of organization.

In Germany a special office in the telegraph service was created in 1876, and its incumbent was charged with the duty of following contemporary scientific affairs and encouraging technical research in the field of telegraphy. In 1888 this office was expanded into a bureau. In 1899 the bureau was expanded into an experimental station.¹ At the present day also a *Studiumsgesellschaft* is maintained as a coöperative undertaking by the government and the two great electrical concerns, the *Allgemeine Elektrizitäts-Gesellschaft* and the Siemens and Halske-Schuckert Works. Moreover the close connection between the German governments and higher education enables them to secure the coöperation of specialists engaged in advanced research work in the fields of physical and chemical investigation with the technical corps of their business undertakings. The entire scientific force of the nation is so organized as to render the most efficient service in the solution of practicable problems. Thus the administrative officials are not only in a position to follow easily the technical developments in their department, but also to grant subsidies when expedient, in order to encourage the prosecution of the promising investigations.

As early as 1884 the German telegraph authorities were experimenting with attempts to replace local batteries in the operation of telephone circuits by one central source of energy.² These attempts did not meet with success, and the problem was eventually solved in America. The Germans, however, did not fail to import the improvement, as soon as it became available, just as they had previously imported another American invention of great signi-

¹ Jung, II, p. 92. Since 1886 special appropriations have been sanctioned also by the Bavarian Landtag for the purpose of encouraging scientific research with a view to the improvement of the state railroad, postal, telegraph and telephone undertakings. Cf. *Statistischer Bericht Bayerischer Verkehrsanstalten*, 1890, pp. 145-64.

² A. P. T., 1887, pp. 643-55.

ficance in the progress of telephony, the multiple switchboard.¹ Under the original style of simple switchboard the use of a second operator to effect a connection became necessary as soon as the number of subscribers' lines became so numerous that one operator could not reach any two terminals simultaneously. The purpose of the multiple switchboard is to distribute the work of making connections among a number of operators, each of whom can effect any local connection that may be desired by the subscribers assigned to her care, without the assistance of a second operator. The result is both a saving of time to telephone users and a saving of expense in the operation of the exchange.

The substitution of the common battery for the separate local batteries as the source of energy for exchange operations brought a further saving in time and expense. It made possible the replacement of the magneto calling apparatus by an automatic arrangement which gives the signal to "central" by the mere removal of the subscriber's receiver from the hook where it rests when not in use. The use of tiny incandescent lamps (instead of shutters, or "drops," marked with the subscriber's number) to notify "central" that a connection is desired by a given subscriber was introduced at about the same time as the common battery. By these improvements the operator's attention is attracted more quickly by the subscriber's call signal, and consequently the desired connection is made more quickly. Furthermore, the use of the incandescent lamp enables the operator to supervise a talk without "listening-in," and thus to ascertain promptly when a subscriber has obtained a desired person and when a talk is terminated. The subscriber does not have to remember to "ring off" nor the "central" to ascertain if the subscriber has forgotten that irksome little duty. Thus useless waiting can be spared to the person who calls and useless tying-up of his line to the person who is called, and useless interrogatories, such as "Have you got them?" and "Are you finished?" to the exchange operator.²

¹ Jung, II, pp. 86-90, contains a summary of the technical progress of the imperial telephone system up to 1899. The primary sources of information are the official *Ergebnisse RPT*, which appear at intervals of five years. Cf. also *Die Entwicklung der Fernsprechtechnik*, A. P. T., 1902, pp. 271, 316, 345.

² The most lucid and at the same time most entertaining account of the operations

The first multiple switchboards were brought into Germany in 1886 and installed in the exchanges at Berlin and Hamburg. Their manufacture was quickly taken up by the leading German makers of telephone apparatus, Siemens and Halske, Mix and Genest, and R. Stock and Company (later the *Deutsche Telephonwerke*). Their use was extended after 1893 to the other large cities in response to the increasing size of their exchange systems, and then to the exchanges in smaller cities as they in their turn outgrew the old style of simple switchboard. The magneto calling apparatus was first introduced in thirty of the larger exchanges between 1892 and 1895 in place of the inferior calling devices that had done service before that date. After 1895 it was introduced into all new exchanges until the invention of the common battery switchboard. The latter was introduced during the period 1901-1905 into a number of larger exchanges which were reconstructed during that period in order to keep pace with the increased demands upon the service. In general business men dislike the disturbance which, to a certain extent, is inevitable in connection with alterations of so fundamental a nature, and the present policy of the imperial telephone administration is to substitute the common battery when the existing installations wear out or when the reconstruction of an exchange system is required in order to facilitate the further expansion of the exchange business.

In 1900 an automatic switchboard constructed on the Strowger system was experimentally installed for a special service in Berlin, and more recently has been tried on a larger scale in the city of Hildesheim. The purpose of the substitution of the automatic for the manual switchboard is the elimination of the exchange operator from the telephone system. No matter how carefully trained exchange operators may be, they are after all human beings, subject to all the frailties of human nature. They cannot be expected always to answer calls with the alacrity and to make the desired connections with the certainty of machines. An example of a telephone exchange that has come to the writer's attention is that of H. L. Webb: *The Telephone Business; its Past, Present, and Future*, London, 1904. Schwaighofer, *Grundlagen der Preisbildung*, appendix Vb, states that as a result of the introduction of incandescent lamp signals in the Munich exchange in 1900 one operator could handle 25% more calls than formerly.

change system in which the subscriber makes his own connection without the intervention of alien hands also insures a greater degree of secrecy for telephone conversations than is possible under any system of manual operation. By means of the automatic switchboard, each subscriber can find out for himself when the line of the party whom he wants is unoccupied, and he is not subjected to the liability of the vexatious response, "line busy."

The determination of the conditions under which the introduction of automatic switchboards will produce a saving in the expenses of operation is purely a matter of mathematical computation. These conditions, however, vary considerably under different circumstances. The saving effected by the automatic switchboard increases with the increase in size of the manual switchboard which it replaces. But in its present form it is not capable of handling long-distance as well as local traffic. Moreover, it is better adapted to exchange systems composed of direct or of party lines than to those in which there are many private branch exchanges. Hence, the greater the proportion of long-distance traffic and of private branch exchanges in a given exchange system, the less the advantage of the automatic system of operation.

In Germany the large exchanges are operated under those traffic conditions which are least favorable to the automatic switchboard. Both the use of the private branch exchange and the proportion of long-distance to local traffic are greater in Germany than in America. In 1905 for every one hundred telephones in the imperial postal area that were connected directly with a public exchange, there were sixty and six-tenths telephones connected only indirectly through a private branch exchange. The proportion in America is nothing like this, because the party line in America performs much of the work done by the private branch exchange in Germany. In 1906 the number of long-distance talks in the imperial telephone service was more than one-fifth as great as the number of local talks. In the United States in the same year the number of long-distance talks over the lines of the American Telephone and Telegraph Company was about one thirty-fifth of the number of local talks effected by the forty-three Bell operating companies. The actual ratio of long-distance to local traffic in

America, however, is greatly affected by two circumstances which are not susceptible of statistical treatment. The line of division between local and long-distance traffic is drawn differently in the two countries, and the proportion of the total long-distance traffic of the United States which is performed by the American Telephone and Telegraph Company is very much greater than the proportion of local traffic which is performed by the Bell operating companies.¹ These two circumstances tend to offset one another, but it is impossible to determine to what extent this is the case. In any event the introduction of the automatic switchboard cannot be expected to go on as rapidly in Germany as in the United States. In the former country it is probable that the automatic method of operation will find its greatest field of usefulness in a modified form as a substitute for the party line, or, more strictly speaking, for the manual private branch exchange in urban residential service, and as a substitute for the small manual switchboard in the rural village service, where the demand is not for local intercommunication, but for connection over a common trunk line with a neighboring urban exchange system.

¹ Obviously the technical questions that arise in connection with the introduction of such improvements as the automatic switchboard can be solved only by careful study on the part of specially trained engineers. To attempt a solution by any other method simply exposes the community to the risk of an unwise disposition of the public resources.

From the point of view of the community as a whole there is a limit beyond which the introduction of radical improvements ceases to be advantageous. When the improvement can be made only by throwing on the scrap heap an existing installation which has neither worn out nor become inadequate to meet the existing need, the expediency of the change becomes a question of balancing the certain loss with the expected gain. The introduction of the later improvement will not always be a policy of true economy. It will only be desirable to incur the expense of installing the new

¹ *Annual Report of the American Tel. & Tel. Co.*, 1906, pp. 19, 21. The German figures are taken from the official *Statistischer Bericht* which appears each year and covers the preceding financial year.

equipment if the expected improvement in the service appears sufficiently valuable. These are questions which require for their solution minute calculations that can be made only by trained experts and on the basis of carefully collected statistical data. Under a régime of free competition similar questions may be solved in the course of a struggle for existence waged between the promoters of alternative services. If the rejection by the community of an inferior set of arrangements for performing a given service involves the waste of a quantity of capital, the immediate loss falls on the shoulders of the unlucky, or unwise, promoter of the abandoned venture. But where the liberty of competition is illusory, there is no recourse but for the community to intrust the protection of its investment and the decision between alternative modes of performing the same service to the expert opinion of specially trained public officials.

The community cannot save itself from the danger of mistakes of judgment on the part of its public officials by handing over the monopoly to a private corporation. The latter cannot be expected to introduce improvements except at the expense of users of the service, or of the community which grants the monopoly, and this is precisely what happens under public ownership. Nor are technical experts any less liable to errors of judgment when employed by a private corporation than when employed by the government itself. The expert in the governmental service has, however, one important advantage over the expert in private service. Under public management of business undertakings the means, both of ascertaining and of enforcing the opinion of consumers, are better organized. When a question arises of introducing an improvement that will increase the expense of rendering a certain service, the wishes of those who will be called on to pay the bill find more effective expression through their representative institutions if the service is maintained under public than if under private control. This feeling that their opinions will have more weight on public than on private authorities, reacts on the disposition of the consumers themselves, and makes them readier to take advantage of their representative institutions and to express their wishes in matters of public business management. Thus the expert in the

governmental service can keep in closer touch than can the one in private service with the sources of information on which he must base his calculations, and should be able to compute more accurately the probable effect of a contemplated change in the supply of a certain service on the demand for that service.¹

The best demonstration of the possession of business capacity by public authorities is afforded by their ability to secure and profit by the active coöperation of the users of the service which they are charged to perform. Thus the German authorities demonstrate their possession of real business capacity by their habit of supplementing the annual reports made to them¹ by the organized business interests of the empire by means of special conferences which the representatives of the business community are encouraged to attend whenever an occasion arises. For example, in Bavaria in 1895, there was an unusual number of complaints in regard to the character of the telephone service in Munich.² A circular letter was sent out to the local subscribers by the secretary of the Chamber of Commerce, inquiring whether (a) connections were made correctly and promptly, (b) interruptions in conversations often occurred, (c) operators were impolite, and (d) the same disturbances occurred in interurban as in urban traffic. The replies showed that the dissatisfaction was considerable under heads *a* and *b*. Accordingly the Chamber addressed a memorial to the telephone

¹ With the development of the means of communication and the strengthening of international relationships, the reliability of the trained expert in the determination of important technical problems becomes ever greater. Two generations ago, the trained expert was always in danger of becoming provincialized and falling out of touch with the progress of science. To-day the constant international association of scientific men and practicing engineers is becoming one of the most attractive features of a technical career as well as one of the most efficacious safeguards against scientific provincialism. Indeed the international rivalry of scientific men constitutes a valuable spur to technical progress. Every international exhibition has its gathering of electricians, and each delegation makes a report on its return to its home country. Recently the telegraph and telephone engineers on the Continent of Europe have formed a permanent international association. The first meeting was held in Budapest in September, 1908, and a paper was read and discussed concerning the various methods of automatic telephone exchange operation and the economy of its introduction in place of the manual switchboard. Cf. *Journal Télégraphique*, Dec. 25, 1908, pp. 349-355.

² HGK. Oberbayern, 1895, p. 83.

administration praying for relief in these two respects. The administration answered that the trouble was caused partly by the neglect of the telephone users to follow directions when using their instruments, and partly by the unfamiliarity of the exchange operators with the multiple switchboard which had just been installed. The members of the Chamber were invited to inspect the central office and observe for themselves the methods of exchange operation. This was done to the general satisfaction of all parties.

The same good understanding between the telephone administration and the subscribers to the service prevails in all parts of Germany. The confidence on the part of the telephone users that the administration is always ready to listen to grievances and to make all reasonable efforts to ameliorate conditions that are shown to be susceptible of improvement is a factor of real assistance to the administration in its task of maintaining its service in a satisfactory state of efficiency. The German administrator is proud of this confidence and takes great satisfaction in preserving it. In return, he feels a sense of genuine responsibility towards the community at large for the proper conduct of the business undertaking with which he is charged. Without these mutual feelings of confidence and responsibility the German system of business organization, with a view to coöperation in the work of public administration, would not work with its actual smoothness and efficiency. The sense of responsibility on the part of the administration, combined with the loyal response of the business community when called upon to perform its part in the work of the whole organization, makes it possible for the Germans to dispense with the motive of pecuniary self-interest in the management of such undertakings as the telephone.

CHAPTER VI

THE RELATIONS BETWEEN THE TELEPHONE AND OTHER BRANCHES OF THE GERMAN ELECTRICAL INDUSTRY TO THE ACT OF 1892

THE electrical telegraph was the first application of the electric current to the needs of the workaday world, and for a long time remained the only electrical industry of public importance. The foundation of the further development of the electrical industry was laid in 1866 by the simultaneous invention of the dynamo-electric engine, or, more shortly, the dynamo, by Werner Siemens in Germany and Professor Wheatstone in England. The dynamo, as improved by later inventors, especially by Gramme in 1871, first made possible the cheap generation of electrical power on a large scale. So long as chemical action remained the only source of electrical energy, the profitable application of large currents to industrial purposes had baffled all inventors. When at last this difficulty was surmounted, the electrical industry entered upon a new stage of its development.

In 1876, the same year that witnessed the birth of the telephone, Jablochhoff patented his electric arc lamp. This important invention had to overcome even more obstacles than did the telephone before becoming commercially practicable. But the same unaccountable spirit of invention which in the early telephone industry is personified by the names of Bell, Blake, Dolbear, Edison, Gower, Gray, Hughes, and their associates, displayed itself with equal effect in the arc lighting industry. The work of Brush, Weston, Thomson, Houston, and others quickly established the place of the arc lamp in the world of affairs. The other branch of the electric lighting industry was founded by Edison in 1879 with the invention of the incandescent lamp.¹

In Germany the further development of the lighting industry

¹ Cf. *Central Electric Light and Power Plants*, 1902; *U. S. Bureau of the Census*, 1905, ch. viii.

fell into capable hands.¹ In 1873 a clever young Bavarian, Schuckert by name, after spending a number of years in the electro-technical shops of America, among others in that of Edison, returned to his native land. At once he founded a business of his own, just as Werner Siemens had done a quarter of a century earlier. When the opportunity came he promptly took up the manufacture of arc lamps, and his little shop quickly expanded into a big manufacturing establishment. In 1882 the foundation of the business which later became the great *Allgemeine Elektrizitäts-Gesellschaft* was laid by a far-sighted and energetic engineer until then in the employment of Siemens and Halske, Emil Rathenau by name. He acquired from the *Compagnie Continentale Edison* of Paris the exclusive right to exploit Edison's inventions in the field of incandescent lighting in Germany. As the result of litigation to prevent the infringement of the Edison patent rights, the monopoly in Germany was broken by judicial restriction of the scope of the fundamental patent (1885), and a new impetus was given to the growth of the industry. By this time the discoveries of electrical science during the preceding ten years had become matters of common knowledge, and towards the latter part of the decade there was a general rush of German capital and business enterprise into these branches of the electrical industry.

The origin of electrical traction was not far behind that of the electric light.² In 1879 the old German firm of Siemens and Halske exhibited their first electric railway. In 1881 they established an experimental undertaking in Gross-Lichterfelde, near Berlin, and in 1884 another between Frankfort and Offenbach. It remained, however, for American inventors to make the electric railway a commercial success. Before the end of the decade the systems of Sprague and Thomson-Houston had been perfected and the work of construction had begun. Siemens and Halske had also independently improved their system, and in 1889 made their first

¹ An excellent account of the development of the German electro-technical industry up to the year 1900 is contained in F. Fasolt: *Die sieben grössten deutschen Elektrizitäts-Gesellschaften*, Dresden, 1904.

² Cf. *Street and Electric Railways*, 1902; *U. S. Bureau of the Census*, 1905, Part II.

commercially successful installation at Budapest. In the following year the A. E.-G.¹ acquired the exclusive right to exploit Sprague's patents in Germany, and in 1892 the Thomson-Houston interests in Germany were definitely placed in the hands of the *Union Elektrizitäts-Gesellschaft*.²

In 1890 there were thirty public lighting plants in operation in Germany, and the equipment of a number of horse railways with electric motive power was projected. On January first the total number of electrical undertakings using the public ways was 2,615. Of these 1,923 were in urban and 692 in rural districts; 2,590 installations served for public or private lighting purposes, 16 for power transmission, and 9 for electrolytic operations.³ A year later the number had greatly increased.⁴ Obviously the governmental telegraph and telephone undertaking could no longer be regarded as synonymous with the German electrical industry.

The growth of these other branches of the electrical industry was bound to become a matter of intimate concern to the public telephone authorities. The telegraph, and especially the telephone, is operated by an extremely feeble current. The electric light, on the other hand, and still more the street railway, is operated by a comparatively powerful current. The telegraph is actuated by a current of from one ampere to one-tenth of an ampere, the telephone by one of from a thousandth to a millionth of an ampere. The electric light and street railway require currents, however, of several thousand amperes. In the state of electrical science that prevailed in 1890, the existence of such large currents in the neighborhood of a telephone line was likely to become a source of serious damage to the entire telephone system. In the first place, it exposed the telephone system to danger from powerful stray currents which might escape from adjacent lighting or street railway circuits. These could easily enter the telephone circuit and greatly damage the delicate instruments which were intended to sustain currents only of infinitesimal volume. Before the extent

¹ The usual abbreviation of the Allgemeine Elektrizitäts-Gesellschaft.

² To be referred to hereafter as the Union E.-G.

³ *Journal Télégraphique*, 1891, p. 24.

⁴ *Drucksachen des Reichstages*, 8. Leg.-Per., Sess. 1891, 4. Anlageband, p. 2701.

of this danger was recognized a number of exchanges were completely destroyed by fires caused by the entrance of such stray currents.

Secondly, where two circuits, one carrying a powerful and the other a weak current, ran along parallel to one another, the stronger current was found to exercise a remarkable and extremely disagreeable influence over the weaker. This is the so-called phenomenon of induction. For example, if a trolley wire and a telephone wire run along the same street parallel to one another and only a few feet apart, the effect of the action of the stronger current upon the weaker is to render conversation over the telephone wire uncertain and vexatious. The disturbances produced by induction in the telephone circuit may be described as follows: (1) a steady humming sound; (2) an intermittent musical sound like a distant steam siren whistle; (3) an intermittent rasping sound; and (4) the disarrangement of the call signals at the central office. On the occasions when the current of the electric street railway was suddenly increased, or as suddenly interrupted, — such as, for example, by the short circuiting of a motor or the burning of a fuse, — the majority of the shutters, which at that period were used for call signals in the exchange offices, would drop at once. These peculiar effects of the strong currents on the weak occurred only when the conductors of both currents were placed in close proximity and maintained the same spatial relations to one another for a considerable distance. The resulting induction had no effect on the service actuated by the strong current, confining its pernicious influence to that actuated by the weak.

The German telephone authorities were quick to foresee the danger which the unregulated construction of circuits in the public ways, intended to carry strong currents, would bring to their telephone service. In March, 1886, they forbade the construction of such circuits in the public ways until after they had been notified concerning the nature of the project, and reserved the power of prescribing methods of construction calculated to protect the telephone service from perturbing influences.¹ At that time the

¹ The telephone authorities could control the construction of other electrical undertakings on the public ways only with the consent and coöperation of the police

other branches of the electrical industry were in their infancy, and the policy of the telephone authorities could be maintained temporarily without causing considerable inconvenience to the activity of German enterprise. The authorities meanwhile set about the task of gaining further information in order to be prepared for the definite determination of the relations that should obtain between their telephones and the undertakings using strong currents. It was clear that such a determination could not long be delayed.

In November, 1887, a special commission of the *Elektrotechnischer Verein* was appointed expressly to investigate this matter. On this commission sat some of the most eminent men of science of whom Germany could boast. It is enough to mention the names of Werner Siemens and Helmholtz. The commission made a thorough study of the situation and reported in June, 1888.¹

The cause of the trouble, in the opinion of the commission, was the simultaneous use of the earth both by the telephone and by the power-circuit undertakings in order to complete the electric circuit. The telephone circuit at that time was constructed of a single wire which connected the subscriber's instrument with the central office, and was completed by the grounding of this wire at each end. Thus, the current in each circuit returned to the source of energy at the subscriber's local battery by means of the earth. This method of completing the circuit had always been used in telegraphy, and in telephony gave fair satisfaction, at least on short lines, until the appearance on the scene of alien and more

authorities of the several states of the empire. Under the relations which exist between the governments of the empire and of the most important of the states, the kingdom of Prussia, such administrative coöperation is very easy to establish. In this case the will of the imperial telephone authorities was carried into effect by a decree of the Prussian Ministers of the Interior and of Public Works, dated March 16, 1886, instructing the royal police to prevent the construction of electric conductors in such a way as to interfere with the operation of the telephones, whether by direct contact or by induction. In doubtful cases the telephone authorities were to be consulted concerning the requirements which should be imposed on the promoters of the power-circuit installation in order to protect the telephones, and their wishes were to be respected. In practice, it sufficed at this time to avoid placing power-circuit conductors in close proximity to the telephone lines for any considerable distance. The Prussian decree can be found in the *Ministerial-Blatt der inneren Verwaltung*, 1886, p. 85.

¹ A. P. T. 1888, pp. 635-42.

powerful currents. Even in the absence of such foreign currents, the construction of a number of single telephone wires parallel to one another for a considerable distance subjected each line to inductive disturbances set up by the others. But with the installation of grounded lines carrying large currents the perturbing effects of induction were greatly magnified.

The remedy lay in the exclusion of the ground from one or the other of the circuits concerned. That this would be effectual in protecting the telephone, provided care was taken to prevent the conductor of the strong current from being placed in too close proximity to that of the weak, was shown by the telephone administration's experience with long-distance lines. In order to remove the mutual induction of several long-distance lines strung on the same poles, the ground had been excluded by the device of employing a second wire to complete each circuit. Thus the circuit was made metallic throughout. By taking the additional precaution of altering the position of the pairs of wires with respect to one another at frequent intervals, the perturbing influence of mutual induction was completely destroyed. This device also had the advantage of making it impossible for stray ground currents to enter the telephone system.

The objection to the introduction of metallic circuits throughout the entire telephone system was that it would require the duplication of the existing exchange wire plant and the partial reconstruction of all central offices. The resulting expense could hardly be defrayed without an increase of rates. On the other hand, the same objection applied to the introduction of complete metallic circuits in the power-circuit branch of the electrical industry. The electric light, to be sure, was already operated, as a rule, by means of metallic circuits, but the street railway appeared unlikely to become commercially practicable unless permitted to use the un-insulated rails in order to complete the circuit. If this should prove to be the case, there would be no safety for the telephone except in preventing the construction of such street railways in the vicinity of the telephone lines, or in abandoning the earth to its more powerful rival. Experiments were, indeed, being made with systems of electric traction that eliminated the earth from the circuit,

either by using a second wire overhead or by inclosing the metallic circuit in an insulated culvert underneath the track. Each of these systems was subject to serious technical drawbacks, and was also much more costly than that employing a single overhead feed-wire with grounded return. In the opinion of the commission, the insistence that all power-circuit electrical undertakings be required to abstain from making use of the earth would result in seriously impeding the progress of the electrical industry.

The commission recommended that every possible effort be made to insulate power-circuit undertakings, and that where this was not feasible the telephone circuit should be made completely metallic. In any case, conductors bearing strong and weak currents should not be permitted to run parallel to one another in close proximity. The telephone authorities were able to follow the principles laid down in this report for several years without exposing their telephone service to serious disturbance. The requirement that prospective users of the public ways for the purpose of erecting electric circuits should so plan their installations as not to bring strong currents into close proximity with telephone wires worked no great hardship. In the infancy of the power-circuit industry, there was plenty of room on the public ways for all. For a while the avoidance of proximity proved a sufficient protection to the telephone system without the introduction of the metallic circuits. Since for the most part the early power-circuits were established for electric lighting purposes, the question of making a disastrous use of the earth for return currents did not become urgent.

In passing judgment upon such administrative regulations, the fundamental difference between continental and Anglo-Saxon jurisprudence must be taken into consideration. In England, the royal power centralized early and took a judicial form. On the Continent it centralized late and took an administrative form. Many matters, which under the English common law are left to the judiciary, are reserved under continental administrative law to the executive branch of the government. The result was that the determination of the relations between electrical undertakings employing strong and weak currents respectively, which, in the

United States, where the telephones were in private hands, was made in the first instance by the ordinary courts of law, became on the Continent, where the telephones were in public hands, a matter of administrative regulation. Yet under modern constitutional government, these administrative regulations can be made only by virtue of the tacit consent of the legislative authority, and are subject to judicial interpretation in the administrative courts.

The telegraph authorities deduced their power to enforce these requirements from the imperial constitution of 1871, which established the imperial telegraph service and declared that it should be uniform throughout the empire. There was no express grant of the right to make use of the public ways for telegraphic and telephonic purposes, but the telegraph authorities assumed that the creation of the obligation to establish a uniform telegraph system included the grant of the power to make use of all reasonable means for carrying out this obligation. Among these reasonable means they tacitly assumed that the use of the public ways and their maintenance in a condition compatible with the proper functioning of the telegraph and telephone service were intended to be included. So long as no other important interest came into conflict with the pretensions of the telegraph authorities, their interpretation of the constitution was allowed to stand unchallenged. It was only when the time came for the application of the decree of 1886 to the electric street railway that a serious conflict of interest arose.

The necessity for establishing the relations with the power-circuit interests on a more secure basis was then brought home to the telegraph authorities by some difficulties with certain municipal authorities in which their policy towards that branch of the electrical industry had involved them.¹

¹ HGK Oberbayern, 1891, pp. 37-38; HGK Stuttgart, 1891, pp. 40-42. The conflict of interest which arose at this time between the two branches of the electrical industry called forth a considerable quantity of controversial literature. Cf. especially:

Anon.: *Ein Wort zur rechten Zeit über die Benutzung öffentlicher Wege für elektrische Anlagen*, Berlin, 1891;

Anon.: *Die Stellung der Industrie zu den Gesetzentwürfen über Reichs-telegraphen-Anlagen und elektrischen Anlagen*, Berlin, 1891;

In Halle the local authorities had decided in the year 1888 to build a municipal street railway in order to compete with the existing private street railway and to compel it to improve its service. This municipal road was originally intended to be leased, and operated by horse power, and a lease was actually made out on that basis. In 1890, however, the A. E.-G., then searching for an opportunity to make use of the Sprague street railway patents, which it had just acquired, induced the lessee, with the consent of the municipal authorities, to assign his lease in order that the road might be equipped with electricity as a motive power. The new contract with the city was executed May 4 and 6, 1890. The telegraph authorities at once objected on the ground that the installation as planned would seriously interfere with the operation of their telephone circuits. The municipal authorities insisted, however, on permitting the A. E.-G. to make use of the uninsulated rails in order to complete the electric circuit. Ultimately electric traction was installed to the satisfaction of the telegraph authorities without abandoning the use of the trolley system of operation.¹ The municipal authorities, however, still asserted their right to dispose of their streets as they saw fit, and the telegraph authorities refused to abandon their claim to the protection of the telegraphs and telephones against the damaging influence of other electrical undertakings.

The case was appealed to the courts. The administration contended that since its works were constructed for an important public purpose it was not reasonable that other installations should be permitted to occupy the public ways and seriously interfere with their use for telephonic purposes. The opposing party contended, on the other hand, that the public ways were made primarily to travel through, not to talk through, and that

von Bär: *Der Gesetzentwurf über das Telegraphenwesen des Deutschen Reichs* (Nr. 32 der Nation), Berlin, 1891;

Ludewig: *Zu dem Entwurf eines Gesetzes über das Telegraphenwesen des Deutschen Reichs*, A. P. T., Ergänzungsheft, August, 1891;

Maas: "Der Telegraphengesetzentwurf und seine Gefahren. Eine Kritik," Heft 28 der *Volkswirtschaftlichen Zeitfragen*, Berlin, 1891.

¹ *Bericht über den Stand und die Verwaltung der Gemeinde-Angelegenheiten der Stadt Halle-a.-S. für 1892-93.*

their use for telephonic purposes should not be allowed to impede their use for more appropriate purposes. The courts ultimately decided against the telephone authorities, declaring in substance that they had no paramount rights in the public ways over those of persons who wished to use them for transportation purposes. In accordance with this view, the electric street railways had at least as good a claim to the use of the earth to complete their circuits as had the telegraph administration. The effect of the decision would have been to require the telegraph authorities to protect their telephone lines against the perturbing influence of the power-circuit undertakings by introducing metallic circuits at their own expense. But events moved too rapidly to permit this case to exercise any important influence over the determination of the relations between the two branches of the electrical industry in the public ways in Germany.

Another conflict occurred in Breslau. In that city the growth of the telephone business had brought about such a congestion of overhead wires that in 1889 the telephone authorities determined to secure relief by putting them underground. This change had already been made in Berlin and Hamburg. In each city the municipal authorities, whose consent was necessary in order that the telephone authorities might dig up the pavements, had granted their consent under conditions that were satisfactory to the telephone authorities.¹ The former could perceive the utility of putting the telephone wires underground as well as could the latter. But in Breslau the situation was more complicated.²

The interests of that city, as of the others, required that the local authorities should maintain control of their streets in order that the work of the telephone administration might not be allowed to hamper their own program of work. This consideration was especially important in Breslau because the municipal authorities were then contemplating the establishment of a municipal electric lighting plant. The necessity of reserving such control became even more apparent when in the following year, 1890, a proposal

¹ *Ergebnisse R. P. T.*, 1886-90.

² *Verwaltungs-Bericht der Stadt Breslau für die Periode 1889-92*, pp. 554-55, 557-60.

to establish an electric street railway came up for consideration. The operation of street railway circuits in the same streets in which grounded telephone wires were buried would seriously impede the operation of the latter. The special arrangements which would be required of the street railway promoters in order to protect the telephones would increase materially the cost of their undertaking. The municipal authorities wished to protect the promoters against such extraordinary charges, for their effect would be, in one way or another, to make less favorable to the city of Breslau the terms on which an electric street railway would be established.

The municipal authorities kept these considerations in mind when they opened negotiations with the telephone administration, although, of course, they also desired that the latter should be able to give as good telephone service as possible. An agreement which seemed to settle all the points in question was made with the local telephone officials, but was rejected by the superior telegraph authorities on the ground that it was in violation of their rights. Thereupon the municipal authorities broke off the negotiations. Not until after the installation of a municipal electric lighting plant had been determined upon, and arrangements concluded for the construction of the electric street railway, did the municipal authorities signify their willingness to reopen negotiations with the telegraph authorities. By that time the latter were willing to accept the most favorable terms that should be obtainable.

The agreement between the city of Breslau and the imperial telegraph administration was concluded July 28, 1891. The city, on its part, bound itself so to lay its electric light cables as to keep the current removed as far as possible from telephone cables which should have been previously placed underground. All special work, which should be required in order to protect telephone circuits from disturbance by either later or preëxisting electric lighting circuits, should be executed by the telegraph authorities and should be performed on whichever circuits should be more convenient. The incidence of the costs which should arise in connection with such works should be divided between the

respective parties according as the power-circuits, giving rise to disturbances on the telephone lines, were: (1) electric lighting circuits of any sort already laid or under consideration at the time of the agreement; (2) electric lighting circuits owned by the municipality which should be laid thereafter; (3) electric lighting circuits owned by private individuals which should be laid thereafter for the purpose of lighting the public ways; and (4) the same, which should be laid thereafter for the purpose of delivering current for private illumination. In cases one and two, the telegraph authorities were to bear the entire cost of protecting their circuits. In cases three and four, the incidence of the costs should vary according as the disturbing circuits should be installed before or after the cables of the telegraph authorities. In the former alternative the telegraph authorities should bear two thirds of the costs in case three, and one third in case four. In the latter alternative they should bear one third of the cost in case three, and in case four the entire costs should be borne by the private interests concerned. The same conditions were to apply also to electric street railway circuits.

This agreement marked the complete breakdown of the telegraph administration's policy of protecting its telephone system. In 1890, out of all the 2,615 electrical undertakings which were using the public ways, only thirty-five cases of disturbance with the telephone were reported.¹ In six of these cases the cause of the disturbance was attributable to noncompliance with the regulations of the telegraph administration.² After the adoption of a refractory attitude towards the regulations by the municipal authorities at Halle and Breslau, this cause of disturbance of the telephones was certain to increase. Clearly, with the further growth of electrical undertakings of all kinds and especially with the introduction of electric street railways, the department, by virtue of administrative order alone, could no longer hope to restrain the power-circuit undertakings from using the earth to complete their circuits, nor assess upon them all the costs of pro-

¹ A. P. T., 1890, pp. 610-11. Cf. also, *Drucksachen des Reichstages*, 8. Leg.-Per., 1. Session, Nr. 308.

² J. T. 1891, pp. 24, 58.

tecting the telephone circuits against disturbance by induction. The more ample powers which had become indispensable could be obtained only from the Reichstag.

There was another reason for seeking legislation from the Reichstag at this time. The telegraph administration's exclusive right to conduct a public telephone business had itself been challenged. This right, or rather the fundamental right on which this was based, the monopoly of the telegraphs themselves, had always been a topic for debate between writers on German constitutional and administrative law.¹ With the increase of the use of the telephone for private purposes, the number of cases also increased in which the telegraph administration's assumption of monopoly was irksome, and the determination of the legality of the telegraph administration's claims became of immediate importance. The legality of the assumption of the telegraph authorities, that the telephone was a telegraph within the meaning of the German constitution, had been given practical effect, at least throughout the greater portion of the imperial telegraph area, by two circulars issued by the Prussian Minister of the Interior, one October 27, 1880, the other September 15, 1882. These circulars instructed the Prussian state police to proceed at once against any persons who should erect telephone lines without the consent of the telegraph authorities. The validity of these orders, however, rested on the assumption that the telephone was in law a telegraph. A case was made up and the point was determined by a decision of the imperial supreme court in 1889 in favor of the telegraph

¹ H. Horch: "Die verwaltungsrechtlichen Grundlagen des Telephonrechtes," *Archiv für öffentliches Recht*, Band VI (1891), pp. 138-55.

F. Meili: *Das Telephonrecht*, 1885; *Die Telegraphen und Telephonen in ihrer rechtlichen Bedeutung*, 1892.

The German imperial telegraph monopoly was contested by:

(a) Laband: *Staatsrecht des Deutschen Reichs*, 2d ed., II, p. 68.

(b) Löning: *Verwaltungsrecht*, p. 611.

(c) Schulze: *Deutsches Staatsrecht*, II, p. 201.

It was affirmed by Zorn: *Deutsches Staatsrecht*, II, p. 17.

An excellent discussion of the legal status of the German state telegraph is contained in H. Stephan: *Geschichte der preussischen Post von ihrem Ursprunge bis auf die Gegenwart*, Berlin, 1859, pp. 675 ff. In 1890, Stephan was at the head of the German postal and telegraph service.

authorities.¹ The effect of this decision was, however, simply to divert the attack from the telephone to the telegraph monopoly itself. The imperial constitution was not explicit on this point. It contained no express grant of monopoly, but the telegraph administration construed as a grant of monopoly the clause which declared that the telegraph system should be uniform throughout the empire. In a test case decided July 10, 1890, by the court of first instance, it was held that under the German constitution the public authorities possessed no exclusive monopoly of the telegraphs.² This decision, if confirmed by the upper courts, would have seriously impeded the efforts of the telegraph authorities to maintain a uniform system throughout the empire.

Accordingly, the telegraph administration did not await the result of an appeal of the test case to the higher courts, but prepared to secure at once from the Reichstag both the confirmation of the telephone monopoly and the power to restrain the power-circuit electrical interests from inflicting damages on the telephone system for which they would not pay. The drafts of two proposed laws intended to secure these objects were published early in the year 1891.³

The first of these bills declared the operation of telegraphs and telephones to be a governmental monopoly, but made provision for the construction of private lines in certain cases in which they had been previously permitted by special regulations. The second bill reserved to the Bundesrat the right to make police regulations for the purpose of controlling the construction and operation of electrical undertakings in general. It was expressly provided that electrical conductors, which should thereafter be erected on public ways, should be so constructed as not to interfere with the operation of previously existing electrical installations, nor render impossible the use of the public ways for the later erection of electric telegraphs, telephones, or other public signal systems.

¹ A. P. T., 1889, pp. 398-404.

² "Erkenntnis des Landesgerichts I zu Berlin von 10 Juli, 1890:" *Archiv für öffentliches Recht*, Band VI (1891), pp. 535-55. Cf. *Drucksachen des Reichstages*, 8. Leg.-Per., 1. Session, Nr. 308.

³ *Reichsanzeiger*, Jan. 22, 1891. Cf., also, *Elektrotechnische Zeitschrift*, 1891, pp. 55, 117.

To insure the proper enforcement of this provision, it was further proposed that thereafter no electrical undertaking should be constructed without the preliminary approval of the administrative authorities. Differences as to the extent of protection against power-circuit undertakings that might arise between the telephone authorities and the central police authorities in any state of the empire should be settled ultimately by the Bundesrat.

This bill, if enacted, would have given the telegraph authorities ample power for the protection of all their telephone lines, both those already in operation and those to be constructed later. The telegraph administration would have been enabled not only to prevent the erection of power-circuits in the vicinity of its own grounded lines, or to grant permission only under conditions that would have protected the telephones at the cost of the other undertakings, but also to do the same in places where there was at that time neither a telephone line in existence nor any immediate likelihood of there being one. The telephone authorities clearly intended never again to get into such difficulties as had arisen at Halle, nor to be forced into another agreement like that which they already foresaw would result from the negotiations at Breslau. The first bill quickly passed the Bundesrat, and on February 22 reached the popular branch of the imperial legislature, the Reichstag. There it was met with a storm of opposition.¹

The whole electrical industry of Germany was aroused. It would not consent without a struggle to the perpetuation of the conditions imposed on the power-circuit undertakings for the purpose of protecting the governmental telephones, nor did it relish the prospect of being compelled to bear all the expense of re-adjusting the telephone system to the altered conditions that would be brought about by the further growth of power-circuit undertakings. The greatest pressure was brought to bear upon the special committee to which the bill was submitted, March 9, 1891, for more careful consideration, in order to secure its amendment or rejection. The representatives of the power-circuit interests

¹ "Bericht der XVI. Kommission über den Entwurf eines Gesetzes über das Telegraphenwesen des Deutschen Reichs," Nr. 460 der *Drucksachen*, 8. Leg.-Per., 1. Session, 4. Anlageband, 1891.

had sufficient strength to prevent the acceptance of this first bill unless assurance were given that the second would be so modified as to be more acceptable to their branch of the electrical industry. The president of the German Handelstag sent out a circular letter to every chamber of commerce in the empire, calling especial attention to the probable results of the proposed legislation in the electrical industry.¹ He gave force to his warning by pointing out the difficulties that had already arisen in those cities which had undertaken the pioneer work of introducing the electric street railway. He urged all chambers to rally in the support of an amendment to the bill which should require the telegraph authorities, as far as possible, to protect the telephone at their own expense against the perturbing influence of strong currents in the same public ways, whether or not the telephone was the prior installation. This outburst of remonstrance was effective. The committee of the Reichstag declined to accept the proposals of the government. In order to emphasize its opinions, it held up the bill to confirm the government's telegraph monopoly, although that bill had had no original connection with the controversy over the use of the public ways.

It so happened that in the late autumn of 1891 an international electro-technical congress was to be held at Frankfort. The electrical experts of the entire world were expected to attend. Accordingly both the German Association of Electro-technical Engineers (*Elektrotechnischer-Verein*) and the Chamber of Commerce at Frankfort petitioned that no action be taken concerning the determination of the relations that should subsist between telephone and power-circuit electrical industries until the matter could be submitted to this congress for its expert opinion.² All parties agreed to leave the matter in this way, and the Reichstag of 1891 adjourned without taking any further action on the telegraph administration's bills. At the international electro-technical congress the relations that should obtain between the power-circuits and the telephone circuits did not fail to receive due consideration.³ It was at this congress that the first successful

¹ HGK Oberbayern, 1891, pp. 37-38; HGK Stuttgart, 1891, pp. 40-42.

² *Elektrotechnische Zeitschrift*, 1891, pp. 169, 263.

³ *Ibid.*, pp. 675-78.

experiment with the transmission of power over long distances was made. The concourse of experts was roused to a remarkable pitch of enthusiasm over the performance of the big copper wire that brought an electric current to Frankfort from Lauffen-am-Neckar, one hundred miles away. They were in no mood to consent that the new electrical age, which they believed to be dawning, should be held back on account of the danger to the telephone. They recognized that the early method of protecting the telephone circuits by avoiding the construction of power-circuit conductors in close proximity would no longer suffice to prevent the injury of the telephone undertakings. But they could not sanction the maintenance of the later method, the exclusion of the electric light and power interests from using the earth to complete their circuits. Such a policy would throw a heavier burden on the power-circuit interests than it would remove from the governmental telephones. There was no alternative but for the telephone itself to abandon the earth to its stronger rivals and withdraw into the protecting folds of metallic circuits.

The only question that remained was whether the entire cost of the change should be borne by the telegraph authorities alone or should be apportioned in some way between them and the power-circuit interests. The electrical experts did not forget in answering this question that there was another reason for the introduction of metallic circuits in the telephone exchange business. The same phenomenon of mutual induction between the telephone wires themselves, which had already made necessary the introduction of metallic circuits in long-distance telephony, was manifesting itself to an ever-increasing extent in the local exchange systems as the magnitude and complexity of exchange operations increased. The general opinion among the electrical experts at Frankfort was that the telephone administration would soon have to introduce metallic circuits in local exchange telephony to prevent the mutual induction of the exchange lines, whether or not the construction of electric street railways with the overhead trolley and uninsulated rail should go on. Hence they saw no reason for exacting contributions from the power-circuit branch of the industry towards the cost of the transformation of

the telephone administration's grounded circuits into metallic circuits. In short, everybody but the telephone authorities themselves came to the conclusion that the latter alone should bear the entire cost of reconstructing their telephone system and providing against the danger of inductive disturbances of all sorts in the future.

Before any fresh proposals could be introduced into the Reichstag of 1892, a new complication was brought into the situation. The municipal authorities had grown impatient with an organization of the telephone business that bade fair to involve them in endless strife with the imperial authorities over the disposition they should make of their own highways. In the fall of 1891 the city of Cologne inaugurated a movement in favor of municipal ownership of exchange systems combined with imperial ownership of the long-distance telephones.¹ This movement did not originate in dissatisfaction with the existing exchange service of the imperial telephone administration, but in the desire of the local authorities to obtain complete control of their own public ways.² They believed that by that means alone they could bring about permanently satisfactory relations between the conflicting interests in the electrical industry. This movement was enthusiastically indorsed by the German Association of Municipal Authorities (*Städtetag*) which met at Frankfort shortly after the electro-technical congress.³ It declared that the enactment of the government's proposals in their original form would materially impair the usefulness of large portions of the public ways for the purposes of the power-circuit undertakings, and would seriously obstruct that branch of the electrical industry. Furthermore, it insisted that the cities must have full control over their own streets. Finally, it proposed the creation of an independent electrical board, composed of legal and technical members, which should have the power to decide such conflicts of interests as had arisen between the telegraph administration and the representatives of the electric light and power undertakings.

Such was the state of affairs when the Reichstag of 1892 resumed

¹ *Elektrotechnisches Zeitschrift*, 1891, p. 595.

² Cf. Nrn. 512, 549, 570, and 649 der *Drucksachen des Reichstages*, 1891-92.

³ HGK Stuttgart, 1891, pp. 40-42.

the discussion of the project brought over from the previous session. The proposed legislation was referred to the same special committee as before. There the issue was joined squarely.¹ The telephone authorities maintained the ground they had always held, viz., that the power-circuit interests should be required to take steps at their own expense in order to prevent disturbance to telephone lines already in operation or to be erected later. The representatives of the other branches of the electro-technical industry, on the other hand, demanded that the law should require each interest to look out for itself. This requirement would have put all the work and expense of preventing inductive disturbances of all sorts on the shoulders of the telephone administration, since the power-circuits had nothing to fear from the telephone. The telegraph authorities replied that this was not only unfair but impossible, inasmuch as there was no cure for the ill effects of powerful currents on small currents within their sphere of influence. The only remedy lay in prevention. The power-circuit interests, on the other hand, adhered to the doctrine advanced by the electro-technical congress at Frankfort, viz., that adequate protection could be obtained for the telephone by the introduction of metallic circuits. The electro-technical interests won over the majority of the committee to their view. The telegraph authorities saw themselves forced to yield a part of their claims in order to save the rest. Thus the controversy ended in the only way such a controversy could end, by compromise.

It was agreed that the first undertakings to be established in any public way should be entitled to remain undisturbed by later installations. Consequently, the promoters of the latter were put under obligations so to carry out their projects as not to interfere with the operation of the former. If this should not be altogether feasible and the alteration of an existing undertaking should become necessary in order to protect it from a later installation, the entire expense of the alteration should be borne by the promoters

¹ "Zweiter Bericht der XVI. Kommission des Reichstages über den derselben zur nochmaligen Berichterstattung überwiesenen Entwurf eines Gesetzes über das Telegraphwesen des Deutschen Reichs." Nr. 676 der *Drucksachen*, 8. Leg.-Per., 2. Session, 6. Anlageband, 1892.

of the latter. An attempt to compel the telephone administration to equip with metallic circuits all exchange lines which should thereafter be constructed or forfeit its claim for compensation in case of disturbance by a later installation, did not meet with success. The telephone administration insisted on having its hands left free in respect to future construction. When the most important point had thus been settled by compromise, the attempt of the two branches of the electrical industry to come to terms could not be allowed to break down on account of disagreement on the other points at issue. These were, should the telegraph authorities receive the sanction of law for their claims (1) to the exclusive right to erect and operate telegraphs and telephones, and (2) to the privilege of using public ways belonging to local authorities for the purpose of maintaining their telegraph and telephone system.

The first of these did not prove difficult. All parties were ready to acknowledge the principle of a governmental monopoly of the telegraphs and telephones provided that in practice there was security of its satisfactory exercise. This was assured by a concession on the part of the telegraph authorities. They consented that, in case they should refuse to establish or maintain an exchange in any locality, the local authorities might demand a concession for the establishment of a local exchange system on their own account. The imperial authorities should be bound to accede to such a demand, and might also at their own option grant concessions authorizing the establishment of local exchange systems by private enterprise. They were only bound to grant concessions, however, when the systems were to be owned by the municipal authorities.¹ Besides this, telephone undertakings might be established without the approval of the imperial authorities (1) for the use of public officials of all kinds, (2) in connection with the operation of transportation systems, and (3) by private persons within the limits of their own property or to connect several properties belonging to the same person, and situated not more

¹ No application has ever been made, either by local authorities or by private persons, for the establishment of a public exchange system under this clause. It consequently has had no more than a moral effect.

than twenty-five kilometers distant from one another. Such private undertakings, however, might not be open to public use.

The second point was passed over in silence. No formal agreement could have been reached at that time in regard to the conflicting claims of the telegraph and local authorities concerning their respective rights over the public ways. The former would never have consented to the surrender of their assumed privilege of using the public ways at their own pleasure, and the latter would never have consented to the recognition of such a claim. The most serious sources of dispute between the two in respect to the use of the public ways were already removed by the preceding compromises. It was tacitly agreed on both sides not to imperil the fruits of the entire negotiations by insisting on this point. The future difficulties that might arise were left to be disposed of by the courts. This delicious uncertainty satisfied both parties and, together with the other results of the long parliamentary struggle, was given the force of law by the act of April 6, 1892.¹

¹ Fischer: "Das neue deutsche Telegraphengesetz." *Jh. für Gesetzgebung, Verwaltung, und Statistik*, 16. Jahrgang (1892), 3. Heft, pp. 1-44.

Maas: "Der staats- und verwaltungsrechtliche Inhalt des Reichstelegraphengesetzes." *Archiv für öffentliches Recht*, 1892, pp. 479-508.

CHAPTER VII

THE RELATIONS BETWEEN THE TELEPHONE AND OTHER BRANCHES OF THE GERMAN ELECTRICAL INDUSTRY AFTER THE ACT OF 1892

By this act the telegraph authorities were deprived of a part of their previous pretensions. They retained sufficient powers, however, to enable them to protect their urban telephone systems without introducing metallic circuits at their own cost. For the telephone had almost everywhere occupied the public ways before the arrival of the power-circuit undertakings. Consequently the cost of protecting the telephones would fall after the act of 1892, as before, to the share of the latter interests. Thus the telephone authorities gained the substance, if not the letter, of their contention. On the whole, however, the telephone authorities seem to have used their power with moderation. They did not demand that the street railways be excluded from the use of the earth altogether, as was done, for example, in Hungary in 1889.¹ There the local street railway in Budapest was required to insulate its current by the construction of a complete metallic circuit placed in a conduit under the rail. The result, to be sure, was the prevention of disturbance to the telephone system, but at the expense of a disproportionate increase of the cost of construction of the street railway. The promoters of the latter could have accomplished the same result at less expense by installing the metallic circuits in the telephone system itself instead of in their street railway. The German street railway interests, however, found ways of preventing interference with the telephones even cheaper than that of reconstructing the local exchange systems at their own expense on the basis of metallic circuits. They continued to construct their railways with an overhead feed wire and to use the uninsulated rails to complete the circuit. The latter, how-

¹ *Brit. Docs., Parl. Papers ; Report from the Joint Committee on Electric Powers (Protective Clauses)*. House of Lords, Sessional Papers, 1893-94, X. Qs. 460-88, 578-83.

ever, were connected by copper bonds which made the return route through the rails one of comparatively low resistance. The result was to diminish the amount of stray ground current and to make more adequate the protection of the single wire telephone circuits, simply by placing them as far as possible away from the stronger current.

Thus the German local telephone business continued to be conducted on the basis of grounded circuits. As the number of telephone lines in any locality increased, this method gave rise to more and more mutual induction between the telephone wires themselves. Conversations taking place over one line could be more or less distinctly heard over neighboring lines. Local telephone users began to grow discontented with this sort of service and to demand the introduction of technical improvements that would insure quiet lines.¹ The only technical improvement that would insure this was the metallic circuit. Now that the possibility of compelling the power-circuit interests to bear the cost of the introduction of metallic circuits in the telephone system had become remote, the telephone authorities were compelled to face the question of undertaking the task at their own expense. The effect would be an increase of the cost of telephony which could be met only by an increase of rates. Thus the telephone authorities were placed in a dilemma. Either they must irritate a large portion of their subscribers by declining to improve the service in the big cities or they must irritate them by raising the rates in order to make the improvement possible. They were assisted out of this dilemma by the judicial decision of their old conflict with the municipal authorities.

The latter had never ceased stoutly to protest against the claim of the telegraph authorities to use the public ways at their discretion for telegraph and telephone purposes. In some cases the exercise of this claim had been exceedingly vexatious to the municipalities.² The city of Bonn, for example, built an iron bridge over

¹ Ergebnisse RPT, 1891-95, pp. 56-57, refers to these complaints as becoming more numerous in the HGK reports.

² Bericht der XIV. Kommission über den Entwurf eines Telegraphenwegesetzes, *Drucksachen des Reichstages*, 10. Leg.-Per., 1898-1900, 4. Anlageband, Beilage 1.

the Rhine entirely at its own expense. In 1897, when the bridge was still under construction, the telegraph authorities proposed to make use of it when completed for the purpose of carrying telephone lines across the river. At that time telephone connection between Bonn and places on the opposite bank of the Rhine was effected by way of Cologne. The municipal authorities of Bonn consented to such use of their bridge by the telegraph authorities on consideration of the payment of a small annual fee, provided the latter would agree to remove their lines when desired. The latter refused to accept this condition. The municipal authorities wanted the direct telephone connection with the other bank and accordingly abandoned their fee and proviso. They asked merely for the assurance that the telephone authorities would not oppose the subsequent installation on the bridge of any municipal electrical undertaking and would defray the cost of protecting their telephone cables from disturbance by any subsequent municipal electrical undertaking. This assurance was likewise declined by the telephone authorities on the ground that it would be in violation of their rights under the law of 1892.

At that time the city of Bonn was contemplating the construction of a municipal electric railway over the bridge. But if the telephone authorities were to insist on exercising their privilege of determining what measures should be taken for the protection of their telephone lines, and if they should decide that no protection would be adequate against an electrical railway on an iron bridge, the municipal authorities would have to abandon their project. If the position thus assumed by the telephone authorities were tenable, the city of Bonn might be forever prevented from using its own bridge for its own electrical undertakings. Moreover, the telephone authorities declined to lay their telephone cables in the bed of the river. Consequently the municipal authorities were forced to accept the alternative, which was to dispense with direct telephone connection with the other bank of the Rhine. But it was not certain that they would even be allowed to exercise this choice, for the telephone authorities interpreted the act of 1892 to mean that they were entitled to make use of the public ways for their telegraph and telephone lines without obtaining

the previous consent of the local authorities. Consequently they would consider themselves to be acting within their rights by erecting their telephone lines on the bridge even against the wish of the local authorities and by forbidding the latter thereafter to come on the bridge with their own electrical installations.

This situation was intolerable. It was destined, however, to be shortly terminated. In 1894 the city of Breslau, which was determined to carry to the end its fight with the telegraph authorities, brought its case before the courts. It wished to know whether the telegraph authorities had any right to make use of the municipal highways without the permission of the municipal authorities, and asserted for its part that the claim of the telegraph authorities was as unfounded in law as it was unreasonable in fact. This case was fought through all the lower courts and decided by the Supreme Court of the empire on September 21, 1898.¹ The decision was in favor of the city of Breslau. Thereafter telegraph and telephone lines existed in the public ways only on the sufferance of the local authorities.

The new situation was as intolerable to the telegraph administration as the old had been to the municipal authorities. The former had no alternative but to ask the Reichstag for legislation in order to establish a securer tenure for its telegraph and telephone systems. At the same time it saw the wisdom of re-adjusting the financial basis of its telephone undertaking in order to make possible the technical improvements which it would be folly to postpone longer. On January 1, 1898, of the 325,250 local telephone connections of the American Bell Telephone Company, 146,394, or about 45%, were equipped with metallic circuits. In Germany practically none was so equipped.² The change from grounded to metallic circuits would bring a number of advantages: it would relieve the mutual induction of the telephone lines themselves; it would relieve most of the trouble caused by the proximity of large currents; it would improve the quality of long-distance

¹ *Die Rechtsprechungen des Reichs- und Kammergerichtes auf den Gebieten des öffentlichen Rechts*, herausgegeben von v. Kamptz und Delius, vol. ii, Berlin, 1907, pp. 418-20.

² A. P. T., 1898, p. 750.

telephony, so far as the latter was operated in conjunction with local lines. The telephone administration accordingly drew up a plan for the conversion of all its large urban exchanges from grounded to metallic circuits. The work was to be completed within eight years and should be begun at once in the leading commercial centers. At the same time it resolved to ask Parliament to sanction the necessary revision of telephone rates¹ and to grant the necessary powers for the use of the public ways.

It was well understood that the telephone authorities could not secure statutory rights of way over the municipal property without making concessions in return. It was equally well understood that these concessions should take the form of a relaxation of the privileges which the telephone authorities had received under the act of 1892 for the protection of their telephone system from subsequent power-circuit installations. During the half dozen of years that had since elapsed, both the total number of fresh installations and the number owned by the municipalities had greatly increased.² In 1899 every city of over 50,000 inhabitants, most of those of between 40,000 and 50,000, and many smaller cities, were supplied with street railways. Of these threescore or more, only 19 were actually owned by the municipalities in which they were located and only 10 were operated by the municipal authorities. Yet the tendency was decidedly towards an increase of municipal ownership of street railways, and many cities which in 1899 did not yet own the local undertakings were considering plans for their acquisition. Municipal electric lighting plants, according to the industrial census of 1895, existed at that time in 20 cities. By 1899 the number had greatly increased. Of the 42 largest cities, there were only 11 in which the public electric lighting plant was in private hands, and 5 others in which municipal plants were operated under lease by private persons. Public opinion throughout Germany was running strongly in favor of increasing the business undertakings of the municipal authorities. Under these circumstances the municipalities had little difficulty in securing considerable concessions from the telephone authori-

¹ The question of rates will be discussed in a subsequent chapter.

² *Statistisches Jahrbuch deutscher Städte*, Jahrgang X.

ties before the latter's bill was reported to the Reichstag for enactment by the committee to which it had been referred. It was agreed at once that the telephone authorities were to have the right to make use of the public way; the only question was, how much could the municipality secure in return?¹

All parties recognized that the principle of the compromise of 1892 was defective. The requirement that when two electrical undertakings came into injurious proximity on the public ways the later installation should defray the cost of all measures required to protect the earlier, simply made in practice the later tributary to the earlier. The more defective the earlier installation, the greater the amount of tribute that had to be paid by the later. This principle, however, was not wholly abandoned in 1899. It was retained in the case where the telephone was the later installation.² The telephone installations were still to be required not to disturb preëxisting works in the public ways under penalty of bearing the cost of suppressing the disturbance. Yet as there was little likelihood of the telephone ever injuriously affecting any other electrical installation this requirement was of secondary importance. In the contrary case, where the power-circuit installation was the later, a new principle was introduced. In this case the later installation should be bound to refrain from disturbing the operation of preëxisting telephone circuits only so far as possible. In so far as the avoidance of such disturbance was impossible, the telephone authorities would have to undertake the further protection of the lines affected at their own expense. The courts have since held that the telephone authorities must bear the expense of work performed with a view to such additional protection, even when performed not on the telephone line but on the later power-circuit installation.³

¹ "Bericht der XIV. Kommission über den Entwurf eines Telegraphenwegesetzes," *Drucksachen des Reichstages*, 10. Leg.-Per., 1899, Nr. 498.

² This provision was not contained in the original draft of the bill, but was inserted in the *Kommission* at the special request of the representatives of the private street railway interests. Cf. *Mitteilungen des Vereins Deutscher Strassenbahn- und Kleinbahn-Verwaltungen*, January, 1900, p. 23.

³ *Entscheidungen des Reichsgerichtes*, March 14, 1904. This was a case where a municipal street railway, built in accordance with the ordinary principles of street

The purpose of this clause was that the telephone authorities should no longer have the power to forbid the installation of power-circuit undertakings on the ground that the result was to be an unavoidable disturbance of their telephone service. In those cases, however, where the avoidance of disturbance should be impossible, the telephone authorities could require the relocation or removal of the disturbing undertaking, provided (a) that the utilization of the way for the telephone would be otherwise impossible, and (b) that the disturbing undertaking could be operated in some other place. The telephone authorities could require such relocation both when their telephone line was the earlier and when it was the later installation. In the latter case, however, they must pay all the costs. On the other hand, undertakings of public necessity or serving municipalities as sources of revenue (by which is meant water and drainage systems, gas and electric lighting plants, and street railways) were granted a right of way over preëxisting telegraph and telephone lines, provided (a) that the construction of such an undertaking would be impossible, or rendered very difficult, unless the telephone line were relocated; and (b) that it was to be constructed wholly or mainly on the account of the authority which maintained the public way concerned. Under these conditions the municipal authorities could order the relocation or removal of a preëxisting telephone line at the expense of the telephone administration. This was the special concession obtained by the municipalities, and was not extended to private persons who should promote similar undertakings. Long-distance telegraph and telephone lines, however, should not be relocated at the order of local authorities if such relocation would entail disproportionately high costs.¹

railway construction but in such a manner as to interfere with the operation of a preëxisting telephone line as little as possible, still interfered with the exposed line. Some special appliances to relieve the disturbance were installed on the street railway, and the costs were assessed by the courts against the telephone authorities.

¹ In this connection the late imperial Minister of Finance, von Sydow, then chief of the telegraph and telephone administration, stated before the committee that even if such a line could not be relocated except at disproportionately great expense in order to make way for a municipal public work, the telegraph authorities would

This somewhat complicated arrangement was given the force of law on December 18, 1899.¹ It relieved the insupportable situation which had been produced by the law of 1892 and the subsequent judicial decisions, and laid the foundation for good working relations between telephone and power-circuit interests and between the telegraph and local authorities. During the following years, notwithstanding the severe industrial depression which occurred in Germany in 1901-02, the electrical industry made great progress. Public light and power plants existed in 1905 in 881 places as against 486 in 1900. The length of single track of electric street railways increased by 33%, reaching almost 5,000 kilometers in 1905. This growth entailed correspondingly greater effort on the part of the telephone authorities to protect their telephone system. Careful provision was made against direct contact with power-circuits, fuses were inserted in all lines at the point of entering the exchange, and the disturbance by induction was reduced by the introduction of metallic circuits.² From the technical standpoint the results of the act of 1899 have therefore been good.

As might have been anticipated, however, the act of 1899 has given rise to a large crop of litigation.³ There was too much vagueness about many of its provisions. What are to be considered "disproportionately high costs," "possible alternative locations," and "undertakings of public necessity operated mainly on municipal account"? Yet these are questions of detail that can be safely left to judicial determination.⁴ So far as concerns the broad

nevertheless yield the right of way, if the local authorities would bear the expense of relocation; provided of course that there were another possible location. But von Sydow did not state how they would decide what were disproportionately high costs or possible alternative locations.

¹ Von Rohr: *Das Telegraphenwegegesetz*, Berlin, 1900. Schelcher: *Das Telegraphenwegegesetz*, Berlin, 1900.

² Cf. RPT Ergebnisse, 1901-05.

³ Anon.: "Die Kollision von Telegraphenanlagen mit anderen wirtschaftlichen Zwecken dienenden Anlagen auf den Verkehrswegen." *Annalen des Deutschen Reiches*, 1904, pp. 311-317.

⁴ Cf. *Die Rechtsprechungen des Reichs- und Kammergerichtes auf den Gebieten des öffentlichen Rechts*, herausgegeben von v. Kamptz und Delius, vol. ii, Berlin, 1907, pp. 418-20.

question of public policy, the relation of the telephone to the other branches of the electrical industry in Germany may be considered settled.

Indeed the German arrangement of 1899 possesses some advantages over the solution of the same problem in the United States. In the latter country the problem was solved by the judicial determination of the cases brought before the courts of law as soon as the conflict of interest arose. In the leading cases, decided in 1890 and 1891, the courts laid down the principle that the telephones were not entitled to favorable treatment on the public ways and should be required to protect themselves against the disturbing influence of power-circuit installations.¹

The German settlement of 1899 establishes between local public authorities and the telephone administration practically the same relations as were created in America by the judicial decisions handed down at the beginning of the decade. The telephone administration in Germany is bound to protect itself at its own expense against the injurious influence of all municipal electrical undertakings, except in the case of the long-distance lines which cannot be relocated except at a disproportionately great expense. But unlike the private telephone companies in America, it is not bound to do this at its own expense in the case where a later disturbing installation is promoted by private enterprise. This exception would be the rule in America; but in Germany, in the more important cities where the expensive conflicts of interests are most likely to arise, the majority of the electrical undertakings that can cause disturbance to telephone lines are in the hands of the municipal authorities, and the tendency is for this majority to increase. Hence, the disadvantages of the discrimination against private enterprise are much less than they would be in a country where private enterprise is a more important factor in the operation of municipal monopolies. The advantage of the German arrangement is its greater flexibility. Under the American judicial decisions a hard and fast rule has been laid down from

¹ "Cumberland Telephone and Telegraph Company vs. The United Electric Railway," 42 *Fed. Rep.* 273. "The Cincinnati Inclined Plane Railway Company vs. The City and Suburban Telegraph Association," *Sup. Ct. of Ohio, Term 1891*.

which there can be no departure. In Germany, where the public interest would be promoted by the relocation of a municipal undertaking, which if not relocated would render impossible or extremely difficult the establishment of a desirable telephone line, a procedure is provided for bringing about the change without impairing the equity of either party.

The Germans, however, required nearly a decade to reach this result. The trend of the judicial decisions in the United States was promptly reported in the German technical press, and was consequently well known to the German electro-technical interests as well as to the telephone administration. The effect of these decisions on the conduct of the telephone business was also well understood. The fact that the telephone company in Nashville immediately abandoned the use of the earth-return and began the introduction of metallic circuits after the decision of the first leading case was reported at once in the leading German electro-technical journal.¹ The decision in the Halle case was in line with the American decisions, and would have forced the German telephone administration likewise to adopt at its own expense a similar technical procedure in order to protect its business, but for the legislative compromise of 1892.

The question now arises, to what extent was the development of the German electro-technical industry retarded by the obligation under which the promoters of new undertakings were placed to refrain from the disturbance of previously erected telephone lines, or to defray the expense of repairing the damage they might cause? A fair index of the growth of the electro-technical industry is afforded by the record of the annual construction of central electric light and power stations.²

<i>Year</i>	<i>No. of stations established</i>	<i>Year</i>	<i>No. of stations established</i>
1888	15	1893	31
1889	7	1894	36
1890	8	1895	63
1891	13	1896	74
1892	22	1897	106

¹ *Elektrotechnische Zeitschrift*, 1890, p. 612.

² *Ibid.*, Feb. 26, 1906.

1898	152	1902	84
1899	142	1903	82
1900	144	1904	62
1901	94	1905	<u>40</u>
		Total	1175

There were, moreover, 80 stations which were completed in 1905 but not reported, and 540 stations were under construction. The figures do not include the block and private stations, that is, stations which made no use of the public ways for the distribution of current to the public. These figures show that the industry had scarcely gained a start before the enactment of the compromise legislation of 1892. Then its rate of growth was accelerated and during the latter half of the decade reached its maximum. After the passage of the more liberal law of 1899, the rate of growth slackened and since the opening of the new century has been much less rapid. If the number of arc and incandescent lamps and the number of miles of electric street railway in operation were taken as the index of growth, the contrast between the quinquennial periods before and after the turn of the century would be less striking, but it would still be manifest. Either the act of 1899 had a contrary effect to that which was intended, or the growth of the industry was controlled by other and more powerful forces than the imperial legislation. It will soon appear which is the true explanation.

The opening years of the twentieth century witnessed a serious industrial depression in Germany. In no branch of industry was this depression more marked than in the electro-technical.¹ The effects are thus summed up by a German electrical engineer writing shortly after the event:²

"The seven great companies have received some deep wounds. One has been compelled to atone for its sins in the realm of business enterprise with its life (Kummer). Others have been condemned to pass their dividends for several years on end (Schuckert, Lahmeyer, and

¹ Cf. *Schriften des Vereins für Socialpolitik*, vols. 105-12: *Die Störungen im deutschen Wirtschaftsleben während der Jahre 1900 ff.*; see esp. vol. 107: *Die elektrotechnische Industrie*, by J. Loewe.

² Fasolt, p. 182.

Helios). Most fortunate were those which escaped with only a reduction of their profits (Siemens and Halske, *Union Elektrizitäts-Gesellschaft*). The A. E.-G. alone survived unscathed. Even its dividends had to be cut."

The period of speculation culminated in 1900. The crisis was at its worst in 1902. The last named company paid 15% in 1900 and 8% in 1902. Siemens and Halske paid 10% in 1900 and 4% in 1902. Schuckert paid 15% in 1900 and nothing in 1902. The Lahmeyer, Kummer, and Helios companies each paid 11% in 1900 and nothing in 1902.¹ The effects were even worse for the wage earners than for the capitalists. The three greatest companies of all, two of whom survived the crisis with no more than a temporary diminution of profits, reported the following number of employees in 1900 and 1902 respectively:²

A. E.-G.	17,361	14,897
S. & H.	15,255	14,659
Schuckert	<u>7,413</u>	<u>5,365</u>
Total	40,029	34,921

But these figures do not tell the whole story. They do not show the number of workmen employed on part time, and take no account of the sudden and wholesale dismissals when the crisis was most acute. Thus Siemens and Halske at one time discharged 3,000 of their employees.³ The blow was even heavier for the higher clerical and administrative employees than for the electrical workmen, strictly speaking. In the *Elektrotechnische Zeitschrift* at the end of 1901 there were three advertisements from higher officials and electrical experts out of employment for every one offering it.⁴ Unquestionably the German electro-technical industry suffered severely.

The lesson of the crisis was not mistaken by the leaders of the industry. It was most lucidly stated by the greatest of those leaders, Emil Rathenau, in the annual report of October, 1902, of the A. E.-G.⁵: "The future importance of the electrical industry as a

¹ Cf. Neumann's *Kurztabelle*.

² Koch: *Die Konzentrationsbewegung in der deutschen Elektroindustrie*, 1907, p. 33.

³ *Ibid.*, p. 34.

⁴ *Ibid.*, p. 36.

⁵ *Ibid.*, p. 92.

factor in modern life will not be diminished by its recent calamity. . . . But an improvement will scarcely follow at once. The first task is to recognize the existing conditions and to ascertain the lack of adjustment between production and consumption. This will be easier to-day than a year ago, since in the meantime many events have taken place in sharp contrast to the earlier hopeful prophecies of electrical promoters. What means should be adopted in order to consolidate our industry, we have repeatedly made known. A narrower coöperation of the great firms will scarcely be avoidable, if the prices of our product are once more to be brought up to a remunerative level."

Within a year Rathenau's company had absorbed the *Union Elektrizitäts-Gesellschaft*, and Siemens and Halske and Schuckert had made a working agreement which amounted to the fusion of the most important branches of their undertakings. Thus the four largest of the German electrical concerns applied the lesson of the crisis.¹ The same process was extended throughout the industry, and the outlook began to improve. Not so many new central light and power plants were built as formerly, because the demand for such installations was for the time being nearly satiated; but new fields for the electrical industry were opened up and a new period of prosperity was ushered in.

The significance of these events in the electrical industry at large in connection with the management of the telephone business is twofold. In the first place, they show that the development of the industry was not seriously retarded by the legislation in the interest of the public telephone undertaking. On the contrary, despite the law of 1892, more electrical undertakings were established during the succeeding eight years than the German public was able to support. The business men whose duty it was to estimate the nature and future growth of the demand for electrical installations blundered. They greatly overestimated the utility of their undertakings to the community. Far from being discouraged by the burdens laid upon them by the law of 1892, they were altogether too courageous for their own good. During the second half of the last decade of the century, German electro-technical

¹ Koch, p. 92.

promoters were fairly swept off their feet by the spirit of speculation. Under the circumstances it is unlikely that the legislation of 1892 exercised any considerable influence tending to retard the development of the industry as a whole, although in some individual cases it was vexatious. So far as the industry in general was concerned, the forces which tended to encourage the fever of speculation greatly outweighed all others.

In the second place, the telephone business, which alone was withdrawn from the disastrous competitive struggle of over-sanguine rival promoters, alone passed through the crisis absolutely unscathed. Mix and Genest, the leading manufacturers of telephone apparatus, even increased their dividend during the critical period.¹ The rate in 1900 was 10%, in 1902 14%. This does not mean that the telephone business did not share in the earlier general development. The increase in the value of electro-technical products of German manufacture from 1890-91 to 1898 was as follows:²

Class of product	Value in millions of marks		Percentage of increase
	1890-91	1898	
Dynamos, motors, and transformers	6.50	60.70	835
Telephone apparatus	1.75	8.50	386
Batteries	4.50	13.00	189
Telegraph apparatus	1.50	3.40	127
Incandescent lamps	2.50	5.46	118
Arc lamps	2.00	3.80	90

The production of telephone apparatus compares well enough with that of the other electrical products. The significant point is that the output of electro-technical articles in general increased too rapidly, and that of telephone apparatus did not. But the former were sold on an unregulated market, whereas the latter was sold chiefly to the German telephone administration. Those products for which the demand was ascertained by private business men, incited by their desire for a profit and the resulting competition with one another, were over-produced. Those for which the

¹ Neumann's *Kurstabellen*.

² Fasolt, p. 206.

demand was ascertained by public officials, aided by the organized coöperation of the consumers, were not over-produced. Private enterprise, impelled by the over-sanguine estimates of the competitive business world, made a mistake. Public enterprise, relying upon the scientific calculations of an organized administration, made no mistake. The record of the German telephone administration in weathering the industrial depression of 1901-02 is a gratifying indication of the success of German methods of public business management.

CHAPTER VIII

THE RATE-POLICY OF THE GERMAN TELEGRAPH ADMINISTRATION: THE THEORY OF REASONABLE RATES

WHAT is a reasonable telephone rate?

This is an important question. No matter how energetically the management of a telephone business may seek to extend the service, no matter how persistently it may seek to improve the quality, it cannot secure the patronage which it ought to secure in a given community unless it offers its service at reasonable rates.

The management without doubt is fairly entitled to a remuneration that will cover the expenses of rendering the service. On this basis, the rate which each telephone subscriber might reasonably be required to pay for his service would be proportional to the expense of rendering that particular service. In order to establish such a schedule of rates, the management must have some method of apportioning the total expense of carrying on its undertaking among the various persons who partake of the benefits of the service. This involves, first, the existence of a unit of service which may be employed as the basis of charge and, secondly, the possibility of determining accurately the expense of rendering each of these units of service.

The expense of rendering the service as a whole can be easily reckoned, provided the telephone system is an independent undertaking. It is simply the sum of all the current expenses. These comprise the wages and salaries of employees and managing force, the interest and amortization of the capital invested in the plant, and the rent of buildings and tools which are hired instead of being bought. The capital ought to be amortized as rapidly as the tools and material in which it has been sunk wear out. If the plant is maintained in its original condition by means of current repairs, the expenses of amortization are replaced by payments of wages, and by sums set aside to cover the depreciation and invested in fresh tools and materials. Allowance must also be made for insur-

ance, taxation, payments for rights of way, and occasional liabilities of a miscellaneous character, such as payments on account of judgments for damages, and similar items.

If the telephone system is not an independent undertaking, but is operated in connection with some other, such as a telegraph, postal, electric power, or even railroad system, the determination of the expense of rendering the telephone service alone is more difficult. If the telegraph poles also carry the telephone wires, or if the post-office building also contains the telephone exchange, or if the same employees repair both a rotary transformer on a power-transmission line and a storage battery in a telephone exchange, the apportionment to each service of its fair share of expense is an inconvenient, when not an impossible, operation. By means of the most minute book-keeping it may be done, or the share of each service in joint expenditures may be roughly estimated, or may even be declared arbitrarily. But who can presume to apportion among the several services the salaries of the higher managing officials who devote their valuable time, now to one, now to another branch of the composite undertaking?

The difficulties of determining the expense of rendering any particular unit of service are even greater. What unit of service is to be selected? Shall it be the telephone line and instrument? This may be rented at so much a year, entitling the renter to an unlimited number of connections with all other persons whomsoever attached to the same telephone system. The obvious objection to this method is that different subscribers will make unequal use of their telephone lines. Some will use it many times a day, others only occasionally. It is therefore manifestly unjust to charge all alike unless there is no alternative. Fortunately, the desirability of securing an alternative provides the incentive for discovering one. Shall it be the message itself? This seems a much fairer unit of service than the line and instrument. It also, however, is open to objections. Some subscribers will consume many minutes in completing a communication, others only as many seconds. Some will talk over many miles of intervening space, others just around the corner. Many will wish to converse over their telephone just at the moment when everybody else most

wishes to make use of the service, while others will have occasion to use it only in the comparatively undesirable hours of the early morning or the late evening. Finally, a few will desire to have the exchange kept open during the dead of night, when most of their fellow mortals are glad to cease their talking and sleep.

An ideal telephone rate, based on the expense of rendering the service, must vary according to (a) the value of all the plant employed in effecting each conversation; (b) the time during which the plant is occupied in effecting the conversation; and (c) the labor required to make and break the connection. Under (a) allowance must be made not only for the expenses of construction, but also for those of maintenance and depreciation, and for all other charges that cannot be resolved into payments for the labor and talent occupied in the mere operation of the system. Under (b) consideration must be taken, not only of the actual duration of the conversation, but also of the time during which valuable plant must lie idle in order that it may be ready for use at the particular moment when it is desired. Under (c) provision must be made not only for a contribution towards the pay of the exchange operator for the particular service rendered, but also for a contribution towards his pay for the time during which he waits for calls, and another towards the salaries of the managing force so far as its members concern themselves with the operation of the telephone system.

The difficulty of determining such items with accuracy is apparent. Yet ideal justice, on the basis of the expense of rendering the service, cannot be done to telephone subscribers unless all these items are duly taken into consideration. Neither the message, nor the message-minute, nor the message-minute-mile can do duty as an ideal unit of service. It must be a far nicer unit than any of these. In short, an ideal telephone rate based on the expense of rendering the service would be extremely difficult to make.

The alternative is to abandon the expense of rendering the service as a basis of rate making and attempt a solution of the problem on the basis of the utility of the service. The total expense of carrying on the undertaking will then serve simply to describe the limits within which the actual rates may be adjusted to the

real usefulness of the service in each particular case. The utility of the telephone service to different subscribers varies according to (a) the quantity and nature of the messages that require to be despatched; (b) the number of different desirable connections which the service enables to be effected; and (c) the other modes of communication that are available.

Let us consider first the last of these causes of variations in the utility of telephone service to different subscribers. The greater the difficulty of employing a satisfactory substitute for the telephone, the greater will be the utility of the telephone itself. On the other hand, the greater the availability of the telegraph, postal, pneumatic tube or district messenger services, the less urgently, other things being equal, the need for the telephone will be felt. However, the effect of differences in utility, arising from this cause will not, ordinarily, be reflected in the rates, but in the use of the service; for this cause of variations in the degree of utility ascribed to a telephone service applies with nearly like force to all classes in the same community. But the general level of rates in any one community is determined with a fair degree of accuracy by the general conditions governing the supply of the service in that community. Consequently, this factor does not so much affect the relative rates which different classes of subscribers in the same community are willing to pay as it does the relative use of the service by the community as a whole when compared with other communities. As between communities in which the general level of rates is the same, that community possessing the best supply of other facilities for serving the same purpose as the telephone will have the least use for the telephone service.

In so far, however, as the other facilities are less adequate to satisfy the needs of some members of the same community than of others, the telephone will be more highly valued by the former than by the latter. This leads us back to the first of the causes of variations in the utility of telephone service to different subscribers. The country physician or metropolitan stock-broker would feel the loss of his telephone connection far more than would, for example, the ordinary suburban resident or small shopkeeper. The social uses to which the telephone is extensively put by

ordinary residential subscribers satisfy a far less urgent want than the business uses to which it is put by financial and commercial magnates. The prospective subscriber, to whom the possibility of sending a message by telephone will be only a trifling and occasional convenience, cannot be asked to pay the same price for his service as another to whom it will be a regular necessity.

These differences in the quantity and nature of the messages that different subscribers desire to transmit can exercise an influence on the price of telephone service only because the service of one subscriber is to a certain extent inseparable from that of the whole community. The demand for telephone service does not spring from a purely individual need like that for soap or groceries. Its source lies in a preëminently collective need. No person cares to be the only subscriber to a telephone system. It is only by putting him in closer touch with other persons with whom he is likely to wish to converse that a telephone system can be of any use to him. The more such persons are connected by a telephone system, the more useful is the service to each person concerned. Indeed, the greater a system becomes, the greater the rate at which its total utility increases, for not only the absolute number of subscribers increases, but *ipso facto* the number of possible connections for each subscriber also increases.

It does not follow, however, that the service thereby becomes more useful to every particular subscriber. Some of the earlier subscribers may find nobody among the later subscribers with whom they wish to converse. Conversely, some of the later subscribers may have been induced to join the system only in order to converse with a small number of others who subscribed at the same time. One may care only for a long-distance service, and be indifferent to the size of the local exchange. Another may care only for a certain class of local service and be indifferent to the growth of other classes. For instance, the stock-broker may care to converse only with financial and commercial concerns, and be equally indifferent to the number of stores, shops, and residences that may be connected to his exchange. Retail dealers may be especially desirous of being connected with residences; wholesale dealers equally desirous of being connected with the retailers, but

indifferent to the residences; and residential subscribers, in their turn, chiefly eager to converse among themselves. Some circles of telephone users are comparatively closed, others more open. The former have little, or perhaps even nothing, to gain by the accession of additional subscribers to the system. The latter, on the contrary, will gain a great deal by the extension of the service as a whole.

There is only one way in which the extent of a telephone system can be increased. That is by the attraction of new subscribers who have less use for the service than have the old. If this were not so, they would have subscribed earlier. But if the new subscribers have less use for the service, they can be attracted only by lower rates. So far as such an extension of a telephone system brings an increase of its usefulness to the older subscribers, the latter will be willing to bear, if necessary, a portion of the expense of attracting the new subscribers. For example, the grocer whose customers are on the point of subscribing to the telephone service will not object to paying a little more than formerly if he can thereby help induce them to join the system. He will calculate on saving the extra charge and more by substituting the telephone for the special messenger in the collection of his orders. But the ship-chandler or dealer in business stationery will feel himself injured if an increase in the number of residential subscribers be made at the cost of higher rates for his service. So long as the expansion of a telephone system can be effected without shifting a part of the expense to the shoulders of the old subscribers, all circles of users will welcome the change. But if further expansion becomes dependent on a contribution by the older subscribers towards the expense of serving the new, those circles of users who do not share in the increased benefits of the more extensive service will object to paying any portion of the cost. Consequently, such circles of subscribers will find it to their interest to oppose the further increase of the service. This attitude, however, tends to prevent the telephone service from obtaining its greatest utility to the community as a whole.

As a matter of fact, such a conflict of interest between the general mass of telephone users in a community and certain more

or less closed circles of users is not unlikely to occur. It is sometimes asserted that the total expense of maintaining a telephone service in a given community increases more rapidly than does the number of subscribers. Consequently to double the number of subscribers would more than double the average cost per subscriber of rendering the service. In other words, the telephone business does not conform to the so-called principle of increasing returns, but, on the contrary, is subject to that of diminishing returns. Experience has shown that in many businesses, as the scale of operations increases — at least up to a certain point — the expenses of putting out a given quantity of product diminishes. Consequently the return, measured in terms of commodities produced, increases more rapidly than the size of the investment. In the telephone business, on the contrary, it has been urged that the expense of connecting additional subscribers with the exchange and giving them the communications they desire, does not decrease but increases from the very beginning as the total number of subscribers increases. Hence, as a telephone system increases in size, the average charge per subscriber must inevitably increase also.

This view finds a certain measure of justification both in the nature of the telephone business itself and in the history of its development. As the number of subscribers to a given exchange service increases, the total number of possible connections which the exchange operators may be called on to make increases still faster. For not only may each new subscriber demand to be put in communication with all the old subscribers, but all the old subscribers may also demand to be put in communication with him. The result of this enforced multiplication of labor is to increase the total expense of effecting telephone connections at the central office more rapidly than the number of subscribers itself increases.¹ In practice, after the number of subscribers has reached a certain point, a single operator can no longer effect all the possible connections. It becomes necessary to introduce multiple switchboards. Thereafter, one operator is expected to effect any possible

¹ The formula is $s=n(n-1)$, s being equal to the total number of possible connections, when n equals the total number of subscribers.

connection for a certain definite number of subscribers only. Additional operators are employed to effect the connections desired by the other subscribers, each serving a special group.

The early exchanges, moreover, especially in Europe, served at first only the business portion of the community. It was only later that the service was gradually extended to the residential districts. But these were situated at a considerable distance, even in Europe, from the heart of the business district, where the first central offices were constructed. Consequently the connecting lines had to be longer. The effect of such an extension of a telephone system, therefore, was to increase the average expense of construction per line. Thus, during the early development of the telephone industry, the increase of the number of subscribers brought with it an increase of the expenses both of construction and of operation. Ultimately, however, the telephone system reaches its maximum development, so far as the area over which the service must be supplied is concerned, and further growth can take place only by a process of saturation, so to speak, of the area already covered. Additional subscribers will no longer be composed of persons whose needs are of the same sort as those of the previous subscribers, but who have been previously deterred from joining the system on account of their more remote location. It will be composed of new classes of subscribers who have been slower than the original subscribers to feel a need for the service. The addition of such persons to the telephone system will not involve an increase of the average expense of construction per line. On the contrary, there will be savings in the external construction more than sufficient to offset the increased expense of operation; for the new lines can be put up on old poles, or can be drawn through conduits already in place to receive them. In a properly designed telephone system at the present day there is a great deal of initial construction that will serve to accommodate the increase of the connections for many years to come. It is no longer true that the total expense of maintaining the telephone service in a given community tends to increase more rapidly than the number of subscribers increases.

It is true, however, that the average expense per subscriber for

similar classes of service is much greater in some communities than in others. Different communities require different standards of construction. In a small village the wires may easily be accommodated on rough wooden poles set up along the public ways. In a large city they must be buried under the pavements in expensive artificial conduits. In the village the service may be satisfactorily rendered by open single wires. In the city it is necessary to make use of closed metallic circuits, encased in carefully insulated cables. In short, the standard of construction is necessarily far superior in the large centres of population to that required in less populous communities. Hence the average expense of the service per subscriber is bound to be greater in the former than in the latter.

Many persons, however, have no more use for the telephone in a large place than they would have in a smaller place. Distances, to be sure, are likely to be greater, but, on the other hand, the alternative modes of communication are likely to be better. Friends are not necessarily more numerous, nor tradespeople more remote, in one place than in the other. To the big financial and business interests in the large city the telephone is tremendously useful. But to the small tradespeople and residential subscribers it is doubtful if the need of the service is more perceptible in the large than in the small center of population. Yet it will be more expensive to render an equivalent service to such persons in the former than in the latter. In the small places these persons will be attracted to the local telephone system by the low rates which are possible in such places. In order to attract them to the telephone system in the large places, a correspondingly low rate must be made. But this can be done only at the expense of those persons whose higher valuation of the utility of the telephone service has already led them to join the system. Some of these persons will gladly bear a portion of the added expense, for they will gain by the increase of their range of communication more than they will be called upon to pay. But others will not. These last will be for the most part persons to whom a limited range of service has an extremely high value. A considerable increase in their rates would probably cause only a slight diminution in the quantity of service they would demand. That same increase of

rates would make possible the extension of the service to a large number of small users, none of whom sets a high value on the service, but all of whom together would derive more satisfaction from their use of the service than the big users would lose by the trifling collective curtailment of theirs. Here therefore is an instance of a direct antagonism between the interests of a peculiar special section of the community and the greatest interest of the community as a whole, for the community as a whole would secure a balance of satisfaction by the extension of the service.

If telephone rates are based on the cost of service, supposing such a basis to be a practicable one, the promotion of the greatest interest of the whole community in this case would not be possible. By the adoption of utility as the basis of telephone rates it would be possible, but at the cost of the dissatisfaction of a portion of the telephone users. No system of rates can give universal satisfaction. If the expense of rendering the service be taken as the basis, the price of the service will bear no universal relation to its utility. In other words, the actual price of a telephone service at a particular place will not be an accurate indication of the utility of that particular service; for another telephone user in another place may put a higher valuation on an exactly similar service, which he receives along with a quantity of less desirable service at the same rate as that paid by the first user. On the other hand, if the utility of the service be taken as the basis, the price will bear no direct relation to the expenses of production. For some subscribers in a given community, it will be greater; for others less than if they were connected to independent systems. It appears impossible to make telephone rates in the interests of all classes of telephone users at once. The interests of some must necessarily be sacrificed in order to secure the interests of others.

These practical difficulties, however, do not alter the fact of the existence of an ideally just price for telephone service. A just schedule of rates is that one which will secure the maximum of satisfaction in the community as a whole. Thus, in the case already cited, the increase of the price to one class of users in the community may cause that class to give up a portion of the service which it had previously been enjoying. But if it makes possible

the extension of the service among other classes of the community, and enhances the satisfaction which they derive from the service more than it diminishes that of the first class, such a change of rates would be a change in the direction of ideal justice, for it increases the total satisfaction derived by the community from its telephone service.

The establishment of telephone rates on a basis of ideal justice is a difficult undertaking. Indeed, so long as a telephone system continues to attract new subscribers, it is more than difficult, it is impossible. The number of desirable telephone connections for any particular subscriber or class of subscribers bears no definite relation to the number of possible connections. The addition to a telephone system of new circles of subscribers desiring new classes of service not only increases the total extent of the service, but alters its usefulness to the old circle of subscribers. To some the change brings an increase of utility, to others it does not. Under such circumstances, no schedule of rates, no matter how satisfactory when first adopted, can do permanent justice to all classes of telephone users, or secure indefinitely the maximum of satisfaction to the whole community. Hence arises an ever-present necessity for the modification of the existing telephone rates with a view to a closer accord between the different classes of rates and the utility of the service. The ideal of justice remains ever the same, but the conditions constantly change to which must be accommodated the actual rate schedule that represents this ideal. Reasonable telephone rates are rates which approach this ideal as closely as the circumstances at a given time permit.

The circumstances which may reasonably interpose at a given time to prevent the adjustment of the actual rates to the ideal are inherent in the nature of the industry itself. Thus the simplest, and almost universally, the earliest telephone rates were made on the basis of a fixed annual rental for a telephone line and instrument, entitling the subscriber to an unlimited exchange service. This method of charging was in most communities sooner or later shown to be far from ideal. Yet the introduction of a fairer method of charge — for example, on the basis of the number of messages actually transmitted — was impracticable, so long as there was

no reliable mode of recording accurately the number of effective connections. While the method of charging a flat annual rate was the only method practicable, it could not well be considered unreasonable, however desirable a change might be.

As a result of the technical progress of the industry, more nearly just methods of charging became feasible. Thereafter the further maintenance of annual flat rates was unreasonable. Every progressive telephone management became bound to introduce message rates. The latter, in their turn, may be recognized to fall far short of ideal justice. Yet if the state of telephone technique renders impossible the introduction of a nicer basis of charge, the method of measuring the utility of the service according to the number of messages transmitted must be considered a reasonable one. Whenever it shall become possible to ascertain with accuracy the time-value, so to speak, of plant and labor employed in rendering a given service, the failure to substitute a more precise basis of charge for the ordinary message will then become unpardonable, and message rates will then become unreasonable rates. Under these qualifications the establishment of reasonable rates for telephone service ought to be a feasible undertaking.

Under a regime of free competition, reasonable rates will theoretically be established by the spontaneous operation of the forces of demand and supply. On the one hand, telephone service is desired by divers persons with various degrees of intensity. They are consequently willing to pay various sums in order to secure the service they respectively desire. On the other hand, divers other persons, impelled by the universal desire for a profit, are willing to undertake to furnish telephone service to all who demand it, provided they perceive a prospect of obtaining a satisfactory remuneration for their toil and trouble. In course of time the process of bargaining set up between prospective telephone subscribers and telephone business men by their mutual self-interest will establish a schedule of reasonable rates for telephone service. This result will be reached when each of those business men, whose undertakings are required in order to render the entire amount of service for which subscribers are willing to pay, will be receiving a satisfactory remuneration at the prices which can be

obtained. The subscribers on their part will then have no cause for complaint, because, if the services for which they are paying could be performed for less, some enterprising business men would be doing it. Presumably the existing state of affairs is the one which enables the maximum of satisfaction to be derived from the service as a whole by the community at large. Such, in brief, is the theory of competitive rates.

The method of establishing reasonable telephone rates by means of the free competition of independent telephone systems with one another has the advantage that the operation of rate-making is automatic. So long as a state of free competition actually exists, the telephone subscriber can safely trust to his liberty of choice between the services of rival undertakings to insure him against unreasonable charges.

The difficulty with the theory of competitive rates in the telephone business is that the liberty of choice between rival undertakings is illusory. No two competing systems can offer the same range of communication. The subscribers to one system will have no means of conversing with those to the other. Consequently the prospective subscriber is not free to compare the price levels and conditions of service of the rival undertakings. He is compelled to join that system to which are already connected those persons with whom he most desires to converse.

Moreover, unless he is so fortunate as to find all those persons with whom he desires to converse connected to the same system, he cannot choose between rival services without being thereby deprived of the possibility of effecting a certain proportion of the communications which he would like to carry on by means of the telephone. The utility of the telephone lies in its marvellous power of transmitting the spoken word and reproducing it at a distance. The greater the number of persons who are enabled to converse with one another, regardless of intervening space, by means of a telephone system, the greater is the utility of the system. The most useful telephone system would be one which, like the postal service, reaches everybody. Whatever excludes a portion of the community from participating in the benefits of a telephone system, impairs by so much its usefulness. Now a competitive under-

taking does just that. The subscribers to each undertaking are debarred from carrying on telephonic conversations with the subscribers to the other undertaking. If there are several competing systems, the impairment of the usefulness of the service is correspondingly greater. If there were as many sellers of telephone service as buyers, and all were determined to remain in the business, the telephone would have no usefulness at all.

To be sure, a telephone user can subscribe to all competitive systems, and thus obtain for himself the maximum of utility from the telephone service. If all telephone users do this, competition will not impair the usefulness of the service so far as the users are concerned. They will have no cause for dissatisfaction, provided they pay for their service, not on the basis of the quantity of sets of arrangements kept up for the purpose of rendering the service, but on the basis of its utility to them. So long as they pay only for the amount of service actually received, they need not trouble themselves with the unnecessary and therefore wasteful multiplication of the means of supplying it. Hence, under these most favorable conditions, competition from the consumers' point of view is simply an unthrifty dispensation of the public resources, the burden of which does not fall directly on their shoulders. But under less favorable conditions, it either deprives the service of a more or less considerable portion of its usefulness, or compels the subscriber to pay for plant which he does not use, or does both. Under such conditions the rates could not be reasonable.

Fortunately a permanent state of competition in the telephone business is as impracticable as it is undesirable. Unless those who undertake to supply the service succeed in deluding the users into paying for costly sets of arrangements which are not used, they must defray out of their own pockets the expense of maintaining the superfluous plant. Thus competition, instead of reducing the expenses of rendering the service, increases them. At the same time it brings no corresponding advantage to either consumer or producer. Acute managers of rival telephone undertakings are not slow to discover the folly of waging an expensive struggle for the fragments of the business, when they might peacefully possess themselves of the whole loaf. Not competition, but combination,

is the life of the telephone trade. To be sure, such a combination is always at the mercy of any economic freebooter who can put himself in a position seriously to threaten a renewal of cut-throat competition. But economic freebooters usually have their price, and so long as the leaders of the combination maintain their position, they can pay the price. Competition in the telephone business is bound to be short-lived, provided the managers of the business are let alone by the public authorities.

It so happens, however, that it is impossible for the public authorities not to concern themselves with the telephone business. In order that the business may be conducted on a large enough scale to be of genuine service to the community, it must make use of the public highways. Otherwise, it would be a medium of communication only between persons dwelling in the same block. The public authorities, therefore, are forced to decide upon what terms, if at all, they will grant the use of their highways for telephonic purposes. If they believe in the universal efficacy of free competition as the basis of a well-ordered world of affairs, they will consent without further ado to the use of their highways by all who care to engage in the business of telephone service. It will not be long, however, before they will realize that whatever may be the merits of that policy from the view-point of users of the service, it is decidedly bad for the public highways. Each separate company will dig holes in the gutters to plant poles, or tear up the pavements to bury cables, and the result will be a perpetual state of upheaval and confusion, which will neither improve the superficial condition of the highways, nor facilitate their use by the public. Then the public authorities will be ready to listen to suggestions by those already engaged in the business, that the sanction of additional telephone undertakings will not promote the best interests of the community.¹

¹ John Stuart Mill, in general a rigorous adherent to the theory of *laissez faire*, the theory that the less a government concerns itself with the management of business undertakings the better, wrote in his *Principles of Political Economy* (Book 1, ch. ix, § 4): "When, however, a business of real public importance can only be carried on advantageously on so large a scale as to render the liberty of competition almost illusory, it is an unthrifty dispensation of the public resources that several costly sets of arrangements should be kept up for the purpose of rendering to the community this one

Since the policy of free competition offers no adequate assurance of reasonable rates for telephone service, the question at once arises, How shall they be determined? The only alternative to competition is monopoly of some sort. The forces of demand and supply will operate under a régime of monopoly, as under one of free competition, but the results will not be the same. In the latter case, the interests of the monopolist will ordinarily lead him to fix his rates at a level which is intended to yield him the maximum of profit. Having adopted a tentative schedule of rates, he carefully observes the extent of the demand for his services at those rates and readjusts them, if need be, until the actual sale of his services verifies his calculations. His purpose always is to make as large as possible the surplus that remains after deducting from his gross receipts all the expenses of rendering the service. Consequently, under a régime of unregulated private monopoly, rates are certain to be exorbitant.

In the telephone business, to this disadvantage from the viewpoint of the community of monopolies in general, must be added a further special disadvantage. Not only is there no protection against exorbitant rates, but also there is no security that the distribution of the total charges between the different classes of telephone users will be made on a basis calculated to promote the widest utility of the service, such as it is. For the criterion of a sound monopolistic rate policy is not the greatest utility of the service, but the greatest profit of the monopolist. Unfortunately the two do not coincide. There will, for example, be no incentive to extend the service to wider circles of users, unless such an extension will increase the gross receipts more than it will increase the operating expenses. The enhanced profits, therefore, which the monopolist will obtain from those users whose demand for the service is least elastic, will not be put into extensions for the benefit of those whose demand is more elastic, and to whom, consequently, a small reduction in price would mean a great increase

service. It is much better to treat it at once as a public function, and if it be not such as the government itself could beneficially undertake, it should be made over entire to the company or association that will perform it on the best terms for the public." Clearly, the telephone is such a business.

in satisfaction. Monopoly rates will not enable the community at large to derive from the telephone service the maximum of satisfaction. Therefore, they are not reasonable rates.

Two courses are open to the public authorities in order to protect the interests of the community at large. They may intrust the management of the monopoly to a private monopolist, who will be expected to adopt a policy of unreasonable rates. They may then attempt to set a limit to his unreasonableness by prescribing in advance the highest rates that he may lawfully charge. They may even provide for later reductions of rates, when profits shall exceed a certain amount. Finally, they may secure a certain measure of compensation to the community for the distress caused by the unreasonableness of the rates, such as they may be, by stipulating for a share of the monopoly profits.

The alternative is for the public authorities themselves to administer the monopoly, and thus preserve in their own hands complete power to take whatever steps they may deem expedient, in order to secure to the community the enjoyment of reasonable telephone rates. Before attempting to pass judgment upon these alternatives, we will consider the various rate-policies that have in fact been pursued by some of the more important countries that have engaged in the telephone business.

CHAPTER IX

THE RATE-POLICY OF THE GERMAN TELEPHONE ADMINISTRATION: THE ORIGINAL FLAT RATES

THE earliest rates adopted on the governmental telephone systems in Germany were the so-called flat rates. For a lump sum *per annum* the subscriber was furnished with a telephone instrument, connected with the local exchange, and permitted to converse with the other subscribers during the hours that the exchange was open as often as he pleased. In order to prevent subscribers from holding connections indefinitely and thus excluding other subscribers from the use of the same lines, a limit was set to the duration of a single conversation. Beyond that, the use of the telephone was unrestricted within the limits of the exchange area.

The first flat rate for such unlimited exchange service was fixed by the imperial telephone administration at 200 marks. The telephone users, however, considered this rate exorbitant.¹ Telephone users always consider all rates exorbitant. This fact may as well be premised at the beginning of the discussion. It is not intended thereby to cast any censure upon telephone users. On the contrary, they do right to consider all rates exorbitant. That is not only human nature, but also a security for a progressive rate policy. A reasonable amount of discontent is good for a community. It prevents the public affairs from sticking in ruts. When people become too well satisfied with their environment, there is little likelihood of its improvement.

In the case of the early German telephone rates the discontent of the subscribers proved to be justifiable. Experience quickly showed that this rate had been made unnecessarily high. The telephone authorities of Bavaria and Wurtemberg, who usually took their cue from the imperial authorities, led the way in its reduc-

¹ See the reports of any of the chambers of commerce in cities in which there were telephone exchanges during the years 1881-83. See esp. HGK Oberbayern, 1881, p. 54.

tion. Since they were slower in establishing exchanges, they were able to enjoy the benefit of the initial experience in the imperial service. In Bavaria, where the telegraph authorities did not inaugurate their exchange service until May, 1883, two years after the imperial authorities established their first exchanges, the rate was fixed from the start at 150 marks. In Wurtemberg the rate was originally fixed in 1882 at 200 marks and then quickly reduced to 160 marks by virtue of a special agreement with the local business men of Stuttgart. By a second agreement the rate in that city was reduced on January 1, 1884, to 140 marks.¹ When exchanges were introduced into other Wurtemberg cities, however, the rate was fixed at the same level as in Bavaria. The imperial authorities themselves could not long delay a similar application of the lessons of their early experience in exchange operation. In 1884 they voluntarily reduced the flat rate from 200 marks to 150 marks.

The exchange service was made available to that portion of the business community which did not feel the need of special telephone connections, by the establishment of public call offices. These were placed in convenient locations, such as post and telegraph offices, and could be used by any one on payment of a small fee per call. In Wurtemberg the first public call office was established at the same time as the exchange.² The fee was 50 pfennigs (about 12 cents) for a conversation of five minutes. A second such office was opened in 1883 and the fee was reduced to 20 pfennigs (less than five cents). In the rest of Germany the same policy was pursued. In Munich, at the special request of the Chamber of Commerce, call offices were established in the state railroad freight sheds as well as in the post and telegraph offices.³ The short distances in middle-sized German cities, especially in those business quarters where the telephone first came into use, made these call offices easily accessible to all who were likely to care to use them. This call office service, moreover, was developed in a manner calculated to give it its widest utility. In Wurtemberg, for example,

¹ HGK Stuttgart, 1883, p. 99. Cf. *ante*, p. 30.

² *Verwaltungsbericht* (Württemberg), 1882-83, p. 58.

³ HGK Oberbayern, 1881, p. 55.

the fee, maintained at 20 pfennigs per call for the general public, was reduced to 10 pfennigs per call for regular subscribers to the exchange service. All such persons were provided with cards of identification in order that fraudulent advantage might not be taken of the special rate. However, any person might subscribe to the call-office service alone by paying a flat rate of 4 marks per month, or 40 marks per year. Thus there was ample provision for the needs of such small telephone users as there were at that stage in the development of the telephone service.¹

The peculiar needs of exceptionally large users were equally well met by special rates. Such users could attach additional stations to their direct line and use them as much as they pleased by paying an additional 70 marks a year for each station so attached. In apartment houses, moreover, such extra telephones were installed at half the usual rate, that is for 35 marks a year, but it was necessary that at least two additional stations should be installed in order to obtain the extra reduction. Finally, extra telephones were installed in different offices of the same subscriber, provided they were all under one roof, at a charge of 20 marks per year. These classes of services accommodated the exceptional large users whose calls needed to be distributed among several officials. They were also calculated to stimulate the use of the service in office buildings where no one occupant alone would have paid the rate for a direct exclusive connection. And when the time should come for the extension of the use of the telephone beyond the limits of the world of affairs, these branch-line rates would be available to bring the service within the reach of residential subscribers, just as the rates for party-lines served an identical purpose in the less closely built urban and suburban residential districts of America.

Not only the differences in utility, but also those in the expenses of rendering the exchange service, which manifested themselves at the inauguration of the telephone business, were provided for. The cost of construction of an exchange system was recognized even at the start to depend on more than the mere number of subscribers. For the cost of each subscriber's line varied according

¹ Hassler: *Die Staatstelephonie in Württemberg*, 1st edit., 1887, App.

to its length. Consequently the original flat rates were restricted to subscribers within two kilometers of the exchange. Beyond this limit each subscriber was required to contribute towards the cost of additional line 35 marks per kilometer, or fraction thereof, per year.

This schedule of rates was a reasonable one at the time it was introduced. The telephone was used for exchange purposes only in the large commercial centers. The wants of the rural communities were being satisfied by the construction of telephone lines which would serve to bring them into connection with the general telegraph system of the land. The smaller sort of cities did not yet feel a need for local exchange service, and enjoyed a satisfactory long-distance service through the telegraphs. In the larger cities the service was used only for business purposes. Even within the business districts its use was confined to financial and commercial circles. The retailers were much slower in discovering the need for the telephone. Nobody in Germany then dreamed of using it for residential purposes and in ordinary social intercourse. Consequently, as between different classes of telephone users, the single flat rate measured out fairly even-handed justice.

Nor was it an exorbitant rate. During the period when the single flat rate was in force there was unquestionably a considerable deficit in the joint telegraph and telephone undertaking. An accurate division between the telegraph and telephone business is, however, not practicable.¹ According to a special computation of the results of operation during the financial year 1896, made in order to ascertain the true balance at that time, there was a loss on the telegraphs of 13,059,127 marks, and a gain on the telephones of 4,183,185 marks.² This computation, however, only shows the balance between current receipts and ordinary operating expenses. The fixed charges were not included. When allowance is made for the interest on the capital invested in the telephone branch of the undertaking and for depreciation of plant, extremely difficult allowances to make with accuracy, the net

¹ A. Wagner: *Finanzwissenschaft*, Part II, 2nd edit., 1890, pp. 156-60.

² *Stenographischer Bericht über die Verhandlungen des Reichstages*. 9. Leg.-Per., 5th Session, 1897-98, vol. 6, p. 797; and 10. Leg.-Per., 1st Session, 1899, vol. 2, pp. 1746 ff.

surplus is reduced nearly to a million marks.¹ At that date, therefore, the telephone branch of the undertaking was being operated at a small profit, and the telegraphs at a considerable loss. It is probable that this was the state of affairs throughout the period during which the original telephone rates were in force. In that case, the general level of those rates cannot be held to have been unreasonable.

For a considerable period the normal amount of discontent with the telephone rates was expressed in the form of a demand for a further general reduction rather than for differentiation as between different localities or classes of users. These demands found utterance not only in the reports of the chambers of commerce but also in the debates of the Reichstag on the occasion of the annual discussion of that section of the budget relating to the affairs of the postal and telegraph administration. After the reduction of 1884, Stephan, in whose judgment and good-will commercial circles in general had a large measure of confidence, invariably declared that a further reduction was impossible. These declarations, however, could hardly be expected, and certainly were not by Stephan himself, to close the door to the repetition of the demands at next opportunity. They did not always silence the advocates of lower rates even for the moment.

Thus the Chamber of Commerce at Stuttgart observed in its annual report for 1888 that, since the initial difficulties of developing the service were then overcome, the time had arrived for another reduction of rates.² To be sure, it continued, the request seems a bit inopportune in view of the statements of the Secretary of State for the imperial postal service (Stephan) at the last session of the Reichstag. Nevertheless, it would venture to suggest that steps be taken to make the exchange service cheaper. But Stuttgart was not in the imperial telephone area, and the local business interests were not bound to show so much deference to the opinions of the imperial authorities as were the telephone users in most of Germany. The confidence of the Stuttgart chamber in its local authorities was not disappointed. In 1890 the flat rate

¹ H. Schwaighofer: *Die Grundlagen der Preisbildung im elektrischen Nachrichtenverkehr*, München, 1902, p. 73.

² HGK Stuttgart, 1888, p. 69.

throughout Wurtemberg was reduced to 100 marks. The flat rate for an unlimited service in both urban exchange area and suburbs, which in the rest of the empire was 50 marks more than the ordinary flat rate, or 200 marks in all, was reduced to 125 marks. Finally, unlimited communication throughout the entire district in the vicinity of Stuttgart, in which eight separate small cities were situated, was granted for 150 marks, the amount of the ordinary flat rate in the rest of Germany. This response by the Wurtemberg telephone authorities to the request of the Stuttgart Chamber was, as may be imagined, a source of great satisfaction in Wurtemberg commercial circles.¹

This reduction in Wurtemberg, however, greatly increased the desire of telephone users in other parts of Germany to secure a reduction. In Munich, for example, the local Chamber of Commerce redoubled its efforts to secure lower rates.² In Bavaria, as in the imperial telephone area, the rates had remained unchanged at the level established in 1884. All the varieties of service that were offered in Wurtemberg were also obtainable in Bavaria. The charge for line in excess of two kilometers from the central office was 50 marks instead of 35 marks. The rates for additional connections to the same direct line, and for extension-instruments in the offices of large users, were, however, the same. The rate for branch telephones in office buildings and apartment houses was 50 marks instead of the slightly cheaper Wurtemberg rate. Subscribers paid 10 pfennigs for the use of the public call stations, as in Wurtemberg, but non-subscribers paid 25 pfennigs.³ In 1888 the Munich Chamber began the agitation for lower rates by petitioning for an extension of the flat rate of 150 marks to all subscribers no matter how remote from the central office, or for a readjustment of the mileage charges.⁴ This request was refused. But in the face of the outburst of criticism that followed the reduction in Wurtemberg, something had to be done.

The Bavarian authorities, however, would not assent to such a

¹ HGK Stuttgart, 1890, p. 54.

² HGK Oberbayern, 1891, pp. 36-38. A special petition was sent to the telephone authorities, Oct. 10, 1891, praying for the reduction of the exchange rates to the Wurtemberg level.

³ A. P. T., 1891, pp. 701-709.

⁴ HGK Oberbayern, 1888, p. 45.

reduction as had been made in Wurtemberg. The matter was then carried into the Landtag, or state legislature. The representatives of the commercial interests of the large cities, especially of Munich (there were only eleven exchanges in all Bavaria in 1890), argued strenuously for a reduction.¹ It was shown that the existing rates sufficed to defray the ordinary operating expenses and to provide a surplus equivalent to over 12% of the entire capital invested in the telephone undertaking. The telephone authorities did not deny this, but asserted that these large profits were necessary in order to allow for the very rapid depreciation of telephone plant. After a lively debate, they succeeded in convincing the majority of the representatives of the people of the soundness of their position.² The flat rate remained at 150 marks. Still they wished to make some concession to the telephone users. Accordingly the radius within which the exchange connection would be made without extra mileage charge was increased from two to five kilometers. This distance in Bavarian cities, even in one of the size of Munich (which contained 538,983 inhabitants in 1905), was ample enough to include practically every exchange subscriber.

The Bavarian commercial interests, however, refused to be satisfied with this decision. The next year they renewed their plea for a reduction of the flat rate.³ The attempt made in 1893, like the earlier one, failed because a majority in favor of the reduction could not be secured in the Bavarian Landtag. In 1896 again there is evidence in the annual report of the Munich Chamber of Commerce that a vigorous attempt had been made to secure the long-desired reduction.⁴ On this occasion the lower house of the legislature resolved to request the telephone administration to reduce the flat rate to 100 marks.⁵ The Munich Chamber at once renewed its old efforts, but the attempt was frustrated by the refusal of the upper house to concur in the resolution of the

¹ HGK Oberbayern, 1892, p. 92.

² Debate in the Landtag on Nov. 13, 1891, and Mar. 21, 1892. Cf. especially, speech of Baron von Stauffen on former date, and those of the minister in charge of the telephones on both occasions.

³ HGK Oberbayern, 1893, pp. 81-85.

⁴ *Ibid.*, 1896, pp. 103-105.

⁵ *Stenographischer Bericht der Verhandlungen der Kammer der Abgeordneten*, Feb. 25, 1896.

lower. As in the two earlier cases, when the matter was carried into the legislature, the telephone authorities protested that their profit was not excessive, but was indispensable in order to cover the rapid depreciation of telephone plant. At this period, when they were introducing multiple switchboards in the large exchanges, putting their local wires underground, and equipping long-distance lines with metallic circuits, they had little difficulty in convincing the keepers of the public purse-strings that their position was a reasonable one. In the following year there were the usual number of complaints concerning the height of telephone rates in the special reports and the correspondence of business firms, printed in the annual report of the Munich Chamber of Commerce, but none was indorsed by the Chamber itself. For the time the struggle was abandoned.

The attempts of the Munich Chamber of Commerce to secure a reduction of rates were always supported by the other Bavarian commercial interests. Thus, the Nuremberg Chamber sent in a memorial to the telephone administration in 1891, praying that the flat rate be at least cut in half.¹ In 1892 and 1893 it reaffirmed the same position. In 1893 its opinion was that "a reduction of the telephone rate to 50 marks seems in all respects justifiable," and the Nuremberg Chamber only joined in the more modest request of the Munich Chamber for a reduction to 100 marks, because it feared that a greater reduction might be impracticable.

It is not necessary to follow further the criticism of telephone rates by the commercial interests of Bavaria. Obviously at this period they were the only interests in the community that displayed any noteworthy concern for the development of the telephone service. In the legislature the chief concern of the majority of the representatives of the Bavarian people was not in cheap rates, but in the protection of the public treasury against the danger of loss through bad management of the telephone business. Meanwhile those sections of the community which were interested in the telephone subjected the administration to a running fire of criticism, the purpose of which was to secure the best possible service at the prevailing scale of rates.

¹ HGK Mittelfranken, 1891, p. 49; 1892, p. 53; 1893, p. 51.

The movement for a reduction of telephone rates in Bavaria reproduces both the methods employed and the results achieved by the similar movement in the imperial telephone area. In the larger area, however, the homogeneity of interests among the users of the telephone, which marks the early history of the agitation for lower rates in Bavaria, did not endure so long. In the empire at large there was a greater divergence between different individual and local needs for telephone service than manifested itself in Bavaria. In the latter state one flat rate could be equally satisfactory to all classes of users for a considerable period. In the empire, on the other hand, a differentiation of interests between different users of the telephone service, more marked than had been contemplated by the original schedule of rates, more quickly made an appearance.

In the nature of things, the policy of charging for telephone service on the basis of one single flat rate for all exchanges throughout a huge empire like Germany could not indefinitely remain a reasonable one. The commercial interests in the medium-sized cities, to which the exchange service was quickly extended after its first introduction into the largest business centers, were not slow to discover that the service was not so useful to them as it was in the larger places. In the latter, the number of possible connections, and at that period in Germany the number of possible connections was nearly identical with the number of desirable connections, was much greater. The distances saved by telephoning were also greater than in the compactly built middle-sized cities. This inequality increased steadily with the steady extension of exchange service. In 1885 there were exchange systems in eighty-one cities in the imperial telephone area. In 1890 the number of places with exchange service had increased to 258, and in 1895 to 534. In 1885 the service had scarcely gained a footing in places with less than 50,000 inhabitants. A decade later its use was already widespread in business circles in much smaller places. The time for a readjustment of rates had arrived.

The necessity for a differentiation of the flat rates in order to bring them into closer accord with the different conditions that prevailed in different places was foreshadowed in the very earliest

criticism of the telephone administration's rate-policy. Thus at the convention of the German chambers of commerce held early in 1884, the reduction of the flat rate from 200 marks to 150 marks was urged out of a special regard for the medium-sized cities, in which the commercial interests could not so well afford the higher rate as in the larger places.¹ Later in the same year, the reduction was made, but its benefits were not confined to the places which were asserted to have needed it most. In 1887 the Chamber of Commerce at Wiesbaden proposed the introduction of a graduated schedule of flat rates with a view to reducing the cost of the service to users in the smaller commercial centers.² The German Handelstag, at its meeting in 1892, devoted a good deal of attention to the telephone administration.³ Besides criticising the proposed legislation of 1891, by which the administration had desired to strengthen its legal position, and its policy of requiring guarantees for the construction of long-distance lines, the Handelstag expressed the opinion that the existing schedule of exchange rates was founded on an unsound principle. It recommended the introduction of a more accurate measured service rate, composed of a fixed charge *per annum* of 30 marks for each direct connection, plus a variable charge according to the number of conversations. At its meeting in 1895, it reiterated these views, and formally resolved that the proper extension of telephone service was impossible unless the rate was reformed.⁴

The agitation in favor of a modification of telephone rates was continuous throughout this period. Yet it produced no result. The explanation of this failure does not lie in any unreasonable attitude on the part of the telephone administration. Stephan would have been the last to have asserted that his schedule of rates conformed to ideal justice. On the contrary, he admitted repeatedly that the principle of a single flat rate in all exchange systems throughout the empire was defective.

Thus in the debate that arose in the Reichstag in 1891 over the

¹ *Proceedings of the 12th German Handelstag*. Cf. HGK Stuttgart, 1883, p. 100.

² HGK Wiesbaden, Gutachten, 1887.

³ *Proceedings of the 17th German Handelstag*, 1892.

⁴ *Ibid.*, 1895, session of Feb. 28.

postal and telegraph budget the system of telephone rates was vigorously criticised.¹ Stephan replied that he knew a basis of charge according to the number of messages would be more equitable, but he was prevented from introducing a schedule of rates based on that principle by the lack of a cheap and reliable means of counting the messages. The substitution of a message rate for the flat rate was impossible unless the number of effective connections could be correctly recorded. But no mechanical or electrical device had been invented which would count accurately the number of effective connections, and subscribers could not well be asked to pay for conversations which had never taken place. Manual methods of counting were unsatisfactory, because they gave the subscriber no security against careless or malicious overcharge by the exchange operators and exposed the telephone revenues to the danger of depletion by fraudulent practices.

But these technical difficulties in the way of the introduction of message rates did not justify an indefinite maintenance of the single flat rate. It was always possible to introduce a graduated schedule of flat rates. Such a modification of the existing rates would not have favored the small users in any one locality as against the large users, but it would have favored the smaller localities. Moreover it was local, not personal, differentiation that was wanted at that time. It was a reform in this sense that was proposed by the Wiesbaden Chamber in 1887. The same idea also underlay much of the criticism of the administration's rate policy on the part of the Handelstag, although the specific scheme proposed by it in 1892 was based on a different principle. That a change of this nature was not brought about, the German commercial interests had chiefly themselves to blame.

The German chambers of commerce could not unite on and adhere to a common program of reform. On the contrary, each insisted that it was as much entitled as any other to the benefit of the prospective reduction.² The representatives of the medium-

¹ Cf. E. T. Z., 1891, p. 690.

² Cf. R. van der Borcht: "Die Tätigkeit der deutschen Handelskammern im Jahre 1889," *Jahrbuch für National-Oekonomie und Statistik*, vol. 56, pp. 412-24.

sized and small cities asserted that the service was worth less to them. Accordingly, they desired the benefit of any reduction of rates that was to be made. The other party retorted that the service cost less in the large cities and hence they should receive the benefit. In business circles there was no agreement except that lower rates were desirable. But another general reduction was out of the question, and while the general level of rates remained as it was no party could secure a reduction except at the expense of the others. Under these circumstances the telephone authorities can hardly be condemned for leaving the existing rates alone. They could not hope to give general satisfaction whatever policy they might adopt. The introduction of rate discrimination between different localities was simply postponed until the persons most interested should come to some sort of an agreement.

The failure of the chambers of commerce to unite on a common program of reform seems to have been caused by their ignorance of the real nature of the telephone business. Nobody seemed to know whether the expense of rendering telephone exchange service was greater or less in large than in small exchange systems. The prevailing opinion in commercial circles at that time was that the expense of conducting an exchange business tended to fall per subscriber as the number of subscribers increased on account of what were supposed to be the economies of conducting exchange operations on a large scale. Van der Borcht in his work on transportation took this view. He even went so far as to propose a graduated schedule of flat rates for places of different size, according to which the lowest rates would have been introduced into the biggest places.¹ The ordinary business man overlooked the counteracting influences which operate with especial force in young and rapidly growing systems. This was a mistake which was shared by many telephone authorities themselves. In France, for example, when the government first went into the telephone business, it established rates for its exchange service which were to be reduced as soon as the number of subscribers should exceed 300.² The opposite view, namely, that the cost of service was

¹ Van der Borcht: *Das Verkehrswesen*, 1894, pp. 408-411.

² See *post*, Part III, chapter IV.

greater in large than in small exchange systems, was set forth as early as 1887,¹ but at that time not generally accepted, at least not in business circles, as correct. Telephone users failed to realize the effect on the expenses of rendering telephone service of the higher standards of construction and operation demanded in important commercial centers, as compared with the less exacting requirements of second and third rate cities. The effect of these hazy or mistaken notions in regard to the cost of service was to produce the actual conflict within the commercial circles themselves. An arbitrary telephone administration would have taken the matter into its own hands and settled the question regardless of the wishes of the telephone users. But the German was not that kind of an administration. Perhaps, also, it was not then sure in its own mind what the tendency of the future changes in the cost of conducting exchange operations would prove to be.

In one respect the German telephone authorities were undoubtedly remiss. There was another way of providing for the needs of the smaller users. The telephone administration could have encouraged the use of public call offices in connection with the exchange systems. In 1890 there were only 97 such offices in use. This number was wholly inadequate. In many exchange areas there were no call offices at all. The *Handelstag* of 1892 called the administration's attention to this deficiency and urged that the number be greatly increased. Yet in 1895 it had risen only to 215. The establishment of public call offices, however, could not alter the distribution of the burden of telephone service upon different localities. At that time the differentiation of rates as between different persons in the same locality was not felt to be equally important.

The deadlock between the representatives of the commercial interests of the empire in regard to the reform of telephone rates was broken by an attack from an unexpected quarter. It has been previously explained how the telephone was first introduced into Germany in order to connect outlying villages with the general telegraph system. This use of the telephone as a substitute for the telegraph filled a general need, and the number of such rural tele-

¹ A. P. T., 1887, pp. 710-715.

graph offices operated by telephone increased very rapidly. In 1890 the total number of rural telegraph offices was 11,447. Of these 5,837, or over 50%, were operated by telephone, and the proportion of villages which were brought into closer connection with the outer world by that means continued to increase. Yet the time could not be indefinitely deferred when the rural communities would desire a telephone service which would bring them into direct connection with the urban exchange system. Moreover, and this was especially significant in the present connection, exchange facilities were beginning to be desired in the small rural cities which form so characteristic a feature of German rural life. During the years following 1890 the perception of this want became more and more widespread in rural Germany. The monopoly of the use of the exchange service by the commercial classes and the urban districts was clearly doomed. Yet these small semi-medieval rural cities had little use for the telephone at the existing scale of rates. For their modest requirements they desired to pay a more modest price. But at first the rural population had difficulty in making its wants known. The agricultural chambers were not organized until 1894 and did not immediately attain their full effectiveness. Consequently the scene in the next phase of the struggle for the reform in the telephone rates was laid in the Reichstag itself.

The necessity of submitting the annual budget to the approval of a popular branch of the imperial legislature afforded the rural representatives the wished-for opportunity to make known the wants of their constituents. In the early years of the telephone only the representatives of the urban commercial interests participated prominently in these debates. Gradually the representatives from the rural districts began to show a livelier concern for telephone matters, until finally they came to play the preponderating part in such discussions. The turning-point in the history of the criticism of German telephone rates is fairly accurately marked by the fall of Count Caprivi in 1894. Under his successor in the imperial chancellorship, Prince Hohenlohe, the commercial classes lost the dominating influence over German political affairs which they had held under Caprivi, and the special interests of the

agricultural classes received greater consideration. The dissatisfaction of the rural interests with the government's telephone policy culminated with the debate over the budget for the year 1898.

On this occasion the injustice of a single flat exchange rate both for great commercial centers and for small rural villages was brought vigorously to the attention of the telephone administration. Thus one of the rural representatives, Dr. Hammacher, declared:¹ "The rate of 150 marks for a single telephone connection in the rural districts of Silesia is utterly unreasonable. . . . Universal flat rates cannot be maintained. They must be adapted to the various local conditions." The minister at that time in charge of postal and telegraph affairs, von Podbielski, was earnestly desirous of promoting the welfare of the rural districts and did not attempt to defend the existing policy of his administration. He promised that a change should be made at once.

The difficulty was that he could not see his way clear to reducing the rates for the benefit of the rural districts without raising them in the urban exchange areas. The expediency of avoiding a diminution of the telephone revenues at that moment was particularly clear. It was already apparent that the introduction of metallic circuits in the urban exchange systems could not long be deferred, and the probability was steadily becoming greater that this change would have to be made at the expense of the telephone authorities themselves. Hence, in the near future, expenditures were almost certain to increase. Yet even without this additional source of expense, it was impossible to do justice to the rural communities unless the receipts of the telephone administration from the service as a whole were increased. Under the circumstances there was no alternative but to take the bull by the horns. Von Podbielski resolved upon a thorough reform of the entire basis of telephone rates. The big commercial interests should be required to pay more for their telephone service, and the task of appeasing their wounded feelings should be left to the Parliament which had declared the reform to be necessary.

The continuation of the conflict in the Reichstag by the repre-

¹ *Stenogr. Berichte über die Verhandlungen des deutschen Reichstages*, Feb. 2, 1898.

sentatives of the large urban users could not indeed well be avoided. By one clause of the legislative compromise of 1892 between the telephone administration and the critics of its policy with regard to the power-circuit undertakings, its previously unlimited power to fix rates was seriously restricted. One party, indeed, in the committee of the Reichstag, to which the government's proposals had been referred, had wished to deprive the telephone administration of all its independent power over the rates. This view had not prevailed, but a provision was inserted in the final draft of the bill, according to which the telephone administration might reduce rates whenever it pleased, but should not increase them without the consent of the Reichstag. In this form the bill became law. Consequently it was now impossible for the telephone administration to carry out its scheme of reform without running the gauntlet of a thorough parliamentary criticism.

The telephone authorities introduced their proposals for the reform of the exchange rates into the session of the Reichstag following that in which they had promised to make a change in the interests of the rural districts.¹ The nature of the proposed reform was to abandon entirely the flat rate for an unlimited service as a basis of charge. The administration declared that the principle of flat rates was false and should not be retained even in the modified form of a graduated schedule, by which the flat rate should be reduced in amount in correspondence with the diminishing size of exchange systems. It recognized the existence of different standards of construction and service in large and small places and their influence on the expenses of rendering the service. However, it did not propose to reform the existing rates solely on the basis of differences in cost of service. It considered of equal importance the adjustment of the charge in each area to differences in the use of the service in the various areas. Consequently the administration devised a system of charge by which differences both in the cost and in the use of the exchange service were taken into consideration. This system of charge was founded on the combination of a fixed or ground rate with a variable or

¹ *Entwurf einer Fernspreckgebühren-Ordnung*, A. P. T., 1899, pp. 281-313.

message rate. The ground rate was based solely on the fixed charges of rendering the exchange service, and was graduated in order to correspond as nearly as possible to their variation in different exchange areas. The message rate was intended to cover only that portion of the operating expenses which varies directly with the number of messages.

The administration's plan, however, did not contemplate the logical application of the principle of a measured-service rate. The telephone authorities did not propose to establish the variable portion of the new exchange rate on a personal basis by charging each subscriber for the actual number of messages originating at his station, but to compute it on the basis of the average number of messages per subscriber's station in each exchange area. The sum thus separately ascertained for each area was to be charged to all subscribers in each area, regardless of the differences in their individual use of the service. Every three years this sum was to be redetermined. Hence, the proposed reform of 1899 was calculated to establish a larger measure of justice in the charges for telephone exchange service as between different localities, but not as between different persons.

At the same time the telephone administration took advantage of the opportunity to reform the long-distance rates. Hitherto a message had been sent any distance for one mark. Not long before the proposed reform of 1899 even lower rates had been introduced for short distances. In 1897 a charge of 25 pfennigs for long-distance talks of not more than 50 kilometers had been introduced. The progress of the telephone industry, however, had caused these rates to become greatly out of accord with the actual condition of the service. They had been originally established when the long-distance system was in its infancy. Distances were short and the standard of service less exacting than it had come to be with the later increase of length of the long-distance lines. Copper wires had been substituted for the cheaper but less efficient iron, and metallic circuits had been introduced in place of the unsatisfactory single wires with earth return. To a certain extent these causes of increased expense had been neutralized by savings in other ways. The use of the more expensive paper-

insulated air-space cables in the place of open wires, for example, brought an enormous saving in the charges for maintenance. But nothing could counteract the steady increase in length of long-distance connections. Unlike that of the telegraph, the expense of working the long-distance telephone increases rapidly with the increase of distance. The material for telegraph construction is relatively cheaper than that for the long-distance telephone, and the quantity of labor required to operate it is more nearly proportionate to the number of despatches. Hence, in the telegraphic service, the number of words serves tolerably well as a basis of charge. But in the long-distance telephone service, a similar basis of charge — the duration of a conversation — is unsatisfactory. Allowance must be made for the distance covered by the message. This allowance, the administration declared, under the existing schedule of long-distance rates was wholly inadequate.

The effect of the telephone authorities' proposals was expected to be primarily to make the telephone service more available to the rural communities, and to establish the finances of the undertaking as a whole on a sounder and more rational basis. Incidentally, they would settle the deadlock between the large and small urban communities in favor of the latter. But in order to accomplish these results in the way proposed by the telephone administration, it was necessary to increase materially the cost of the telephone service in the large exchange areas. The actual schedule proposed for large exchange systems was as follows:—

<i>Ground Rate</i>		<i>Message Rate</i>		<i>Long-distance Rate</i>	
<i>Number of subscribers</i>	<i>Mks.</i>	<i>Messages</i>	<i>Marks</i>	<i>Distance not more than</i>	<i>Mks.</i>
Not over 1,000	60.	1st 500 ¹	20. (4pf. each)	50 km.	0.25
1,000–5,000	75.	2nd & 3rd	15. (3 “ “)	50–100 “	0.50
5,000–20,000	90.	4th, 5th, 6th	10. (2 “ “)	100–500 “	1.00
Over 20,000	100.	Excess	10.	500–1000 “	1.50
				Over 1000 “	2.00

As a result of the proposed readjustment in the exchange rates, the cost of telephone service would have been increased, according

¹ But in exchange areas where average should be less than 500, the rate should be 5 pfennigs each, and minimum amount 20 marks.

to a computation made in the spring of 1898, in sixteen places, would have remained the same in twenty-one places, and would have been diminished in the other 515 of the existing 552 exchange areas.¹ When the number of subscribers in the different places is taken into consideration, however, the proposed reform is seen to be more drastic. On the basis of the distribution of subscribers on April 1st, 1898, the maximum ground rate would apply to 30,405 subscribers; the second highest to 22,993; the third to 32,421, and the minimum to 43,673. The maximum ground and message rates would not necessarily fall together, but in general the proposed reform meant an increase of rates to all users in the large and busy commercial centers.²

This proposal was, as may well be expected, greeted by a storm of disapproval on the part of the interests to be injuriously affected, the users in the large cities. They naturally preferred that the existing situation should be left alone. For some time they had been realizing more and more that they were the chief beneficiaries under the single flat rate. It was this realization that explains the abandonment of the agitation against the Bavarian rate by the Chamber of Commerce at Munich. The same consciousness of the true location of their own interests had produced a similar result in the other leading commercial centers of the empire. In his speech before the *Elektrotechnischer Verein*,³ in the autumn of 1894, Stephan had boasted that the Berlin exchange system was the largest in the world, that it was indeed not only larger but increasing more rapidly than the telephone system of the entire republic of France, and this boast was justified by the facts. The big commercial interests had every reason to be satisfied both with the service and with the rates which they were enjoying. Nor did they fail to appreciate their situation. Thus, the reports of the Chamber of Commerce at Frankfort, one of the cities which was destined to contribute most heavily towards the

¹ A. P. T., 1899, p. 286.

² *Stenogr. Berichte über die Verhandlungen des Reichstages*, 10 Leg.-Per., 1898-1900, 3. Anlageband, pp. 2441-2462, Nr. 387. *Bericht der XIV. Kommission über den derselben zur Vorberatung überwiesenen Entwurf einer Fernsprechgebühren-Ordnung*. (Cited as XIV. Kom. 1899.) App., 8.

³ Cf. report of annual meeting, Oct. 23, 1894, in next issue of E. T. Z.

cost of this telephone reform, had nothing but praise for the telephone administration during the years immediately preceding the proposal of 1899.¹ When the nature of the contemplated changes in the rates was made known, however, it sent in a vigorous protest to the Reichstag. It urged that no increase be made in the existing rate in large cities, nor change to message rates, nor increase of the long-distance rate for distances about 500 kilometers. It was willing enough that the rates should be reduced for the small places, but strongly averse to the reduction being made at its expense.²

In the Reichstag, however, the representatives of the large places were destined to be overcome both by force of argument and by force of numbers. The administration's plan of reform was referred by the Reichstag to a special committee, before which the telephone administration showed conclusively both the necessity for a differentiation of rates as between different localities, and that for the maintenance of the existing general level of rates. It computed the cost of service in exchange systems of the four different classes which served as the basis of the proposed reform of rates by the following method:³ (a) it multiplied the average cost of a single line per kilometer (which it declared to be 143 marks) by the average length of line in each of the four different classes of exchange systems. (b) To this product it added the cost of the subscriber's telephone station, and (c) the subscriber's share of the cost of the central office and exchange equipment. Thus it reached the following result:—

	<i>In exchange systems containing</i>			
	<i>Not more than 1000 subscribers</i>	<i>1001-5000</i>	<i>5001-20,000</i>	<i>More than 20,000</i>
A.	$1.1 \times 143 = 157.3$	$1.8 \times 143 = 257.4$	$2.2 \times 143 = 314.6$	$2.6 \times 143 = 371.8$
B.	100	100	100	100
C.	19	35	100	115
Total	276.3	392.4	514.6	586.8

¹ Cf. *Mitteilungen aus der Handelskammer zu Frankfurt-am-Main*. (The official organ of the chamber.) 1896-1900. *Passim*.

² *Ibid.*, XXII. Jahrgang (1899), pp. 18-20.

³ XIV. Kom. 1899, App. 7.

In reality this computation is subject to a large percentage of error. First, the cost of construction of a kilometer of line could not be legitimately expressed as an average for all localities. In fact, it was much higher in the places with a high standard of service than in the smaller places. Moreover, this comparison makes no allowance for maintenance charges, but only for the expenses of construction, and the two bear no fixed relation to one another. In fact, expense of maintenance tended to be relatively less as cost of construction increased. Hence, to a certain extent, these errors offset one another. Furthermore, the effect of the differences in the average length of line in different localities is partially neutralized by the mileage-charges on the excess above two kilometers from the central office. Nevertheless, the administration was unquestionably correct in its main contention that the cost of service is greater in the large exchange systems.

The administration was also easily able to show that the use of the telephone varied greatly in the different localities. The average number of annual conversations per subscriber's line in the entire imperial telephone exchange system was 2,750. This was also approximately the number in the two largest telephone exchange systems, those in Berlin and Hamburg. In some other large cities, however, as well as in some smaller ones, the average was twice as high as this. On the other hand, in many other places it was much smaller.¹

Concerning the second of its main contentions, the administration showed that the expense of introducing metallic circuits in the seven largest exchange systems of the empire would amount to 15% of their original cost of construction.² It declared it to be reasonable that those who were to benefit by this alteration should bear the burden. There was not much reply that the big commercial interests could make to these arguments. They could only lamely protest that the exchange service was of such general benefit to the community that the expense of its improvement should be borne by the general body of taxpayers. But the analogy of a telephone exchange to a public park system did not make a deep impression on the representatives of the small cities and rural dis-

¹ A. P. T., 1899, p. 286.

² XIV. Kom. 1899, App. 1.

tricts in the committee. Indeed, there was no occasion for the telephone administration to go to the Reichstag at all unless it intended to raise the rates somewhere.

The real contest in the committee took place between the country representatives, who desired to get the lowest rates possible while they had such a good opportunity, and the telephone administration, which sought to prevent any changes in its proposals that would reduce the total amount of its anticipated revenue. The representatives of the large cities were reduced to the defensive, where they bent all their energies to the task of keeping the inevitable increase of the rates in large exchange-systems as low as possible. Thus, when the representatives of the rural districts attempted to reduce the proposed ground rates to 40 marks in exchange systems with not more than 100 subscribers and to 50 marks in those with from 100 to 500, the representatives of the large cities voted in favor of retaining the proposal of the administration. They had no desire to permit the creation of a deficit which would require a further increase of the charges in large cities.¹

The committee took issue with the telephone administration most particularly over its scheme of measured-service rates. For some reason the flat rate appeals to the ordinary business man in a way that the message rate never has been able to do. Probably it is because the flat rate, even if not altogether equitable, is absolutely certain; whereas under a system of message rates the size of a telephone bill cannot be accurately predicted at the beginning of the year. And where the pocket-book is concerned, the ordinary business man much prefers to face a certain evil than to fly to others that are unknown. In the committee it was argued that there was no practicable way of putting message rates into force. The administration replied that it could not postpone such an urgent reform until a register of talks should be invented. It had experimented with a hundred mechanical and electrical devices, but none was a success. It did not know when such a machine would be invented and did not propose to wait for one for an indefinite period. The method of estimating the number of

¹ XIV. Kom. 1899, minutes of sitting.

effective annual calls by occasional manual registrations of the talks during one day was accurate enough for practical purposes. The committee did not deny this, but nevertheless insisted on retaining the flat rates, although in a modified form. The ultimate result of the proceedings was a compromise.

A schedule of flat rates, graduated according to the size of the different exchange systems, was agreed upon. The amount of differentiation between large and small exchange systems was made as great as the opposition of the representatives of the large systems would permit. It was estimated that this schedule would cause an increase of rates in eighteen places, no change in nineteen, and a reduction in the other 679 of the 716 places which had exchange service at that moment. In two thirds of all the exchange systems in the imperial telephone area the flat rate was cut almost in two. At the same time the general level of the flat rates was maintained at a point satisfactory to the administration. The large number of subscribers in the few places subjected to an increase made this possible without causing the increase per subscriber to be excessively heavy. Moreover, with a view to the more equitable distribution of the cost of exchange service between large and small users in the same area, the proposed scheme of message-rates was retained in a modified form as an alternative of which telephone subscribers might avail themselves if they pleased. The principle of the determination of the message-rate for all the subscribers to a given exchange system according to the average number of talks per line in that system was abandoned. The committee's plan provided that the variable portion of the charge was to be reckoned for each measured-service subscriber on the basis of his actual number of talks. The rate, instead of being degressive as in the administration's original proposal, however, was raised to a uniform charge of 5 pfennigs on all messages with a minimum of 400 messages a year. This was the price which the committee paid in order to secure the administration's consent to the alteration of the basis of charge.

The effect was to give an entirely different turn to the reform from that intended by the telephone administration. The adoption of both bases of charge, the unlimited and the limited ser-

vice, in the new schedule of rates made possible a reduction for small users everywhere and for large users in small places. Thus, the proposed reform of 1899, as amended in the committee of the Reichstag, contemplated a differentiation of rates, both as between localities and as between individuals. The actual schedules were as follows:¹

<i>Size of exchange system</i>	<i>No. of such exchange systems in Feb. 1899</i>	<i>Flat rate (proposed by committee)</i>	<i>Ground and message rate (revised by committee)</i>
Up to 50 subscribers	473	Mks. 80 (only rate)	
51-100	97	100	Mks. 60 + 5 pf. per message
101-200	61	120	
201-500	44	140	
501-1000	18	150	
1001-5000	18	160	Mks. 75 + 5 pf. per message
5001-20000	4	170	Mks. 90 + 5 pf. per message
Over 20000	1	180	Mks. 100 + 5 pf. per message
	<u>716</u>		

The provision among the original proposals of the telephone authorities that they should be authorized to readjust the charges for stations connected with private branch exchanges and for other secondary services was accepted by the committee.² The

¹ XIV. Kom. 1899, App. 9.

² The telephone authorities took advantage of this provision to make some important modifications in the charges for this class of service. Any subscriber could have additional stations attached to the principal stations for his own use for 20 marks a year each. Flat-rate subscribers could have additional stations connected with their lines for the use of other persons for 30 marks a year each. These private branch lines could be installed either by the telephone authorities or by other competent persons. The purpose of these reductions in the charges for private branch exchanges was to encourage the use of that class of service, especially in the urban residential districts. This class of service was very attractive to small users everywhere, who were in a position to employ it in place of direct connections under the measured-service schedule. These private branch exchange rates went into effect at the same time as the others. *Tarifs tél.* II, pp. 27-30.

committee, however, stipulated that the charge for urgent messages should be three times the ordinary rates. In some other respects of comparatively little importance, the administration's proposals were approved without change. The bill in this form received the sanction of the Reichstag and became law on December 20, 1899.

The reform of the telephone rates in the imperial telephone area was imitated in Bavaria and Wurtemberg. Indeed, special delegates of the Bavarian and Wurtemberg governments took part in the work of the parliamentary commission in 1899. This was necessary because the proposed long-distance rates would affect the revenues of the two South German governments. Besides this, however, representatives of the Munich Chamber of Commerce were in attendance at all the public sessions of the commission. On their return they reported to the Chamber on the proposed imperial legislation concerning local rates with a view to action in Bavaria. In accordance with this report the Chamber directed a memorial to the Bavarian administration in which its views were set forth. The Chamber admitted that some action ought to be taken in order that the use of the telephone might be extended among broader classes in both city and country. Nevertheless, although it recognized the justice of the underlying principles of the contemplated reform, it was forced to see in the actual measure proposed an obstacle to the further development of the service, especially among the smaller business circles in the large cities. It decidedly opposed the principle of message rates, and declared that in no case should the cost of telephone service exceed 150 marks a year.¹

The telephone administration in Bavaria under existing legislation was not bound to submit its rates to the approval of the local Landtag, and consequently in default of fresh legislation there was no means of preventing it from making such changes as it pleased. It chose, however, to adopt that policy which should be most likely to be sanctioned by public opinion, and accordingly awaited the action of the German Reichstag on the imperial proposals. After the passage of the act of December 20, 1899, it

¹ HGK Oberbayern, 1899, pp. 87-89.

did not long delay the decree of a similar schedule of rates in Bavaria.¹

Under the Bavarian schedule the message rates were the same as those established in the imperial telephone area, except that the absence of any exchange system as large as that of Berlin made it possible to omit from the Bavarian schedule the maximum rate provided for the imperial capital. A more significant alteration was made in the schedule of flat rates. The minimum Bavarian rate was fixed at the same level as in the imperial telephone area, but the maximum was not raised above the rate which had been in force before the reform. Thus, subscribers in Munich, instead of being forced to pay 30 marks more a year than before, as in Berlin, or 20 marks more, as in exchange systems of corresponding size in the imperial telephone area, continued to pay the original flat rate. The lower stages in the flat-rate schedule were consequently arranged on a different scale from that introduced in the imperial telephone area, so that in all exchanges in Bavaria with more than 200 subscribers the reduction was somewhat greater than in corresponding exchange systems in the imperial telephone area. Thus the Bavarian authorities succeeded in reforming the flat rates without introducing an actual increase anywhere.

In Wurtemberg the agitation which culminated elsewhere in the reform of 1899 had less reason for being. The flat rate since January 1, 1891, had been only two thirds as high as in the other parts of Germany, and the government had always made special effort to foster the use of the telephone by the rural population. Public call offices were established freely in connection with the urban exchange systems, both within the urban limits and in the surrounding villages. The toll rate on all long-distance communications in Wurtemberg was reduced in 1892 from 60 to 50 pfennigs.² In 1897 it was further reduced to 25 pfennigs for all distances less than 50 kilometers.³ At the same time, the suburban and local call-office rates were reduced from 20 to 10 pfennigs. These suburban

¹ *Der Telephongebührentarif vom 27 Feb., 1900. Cf. Kgl. Gesetzes- und Verordnungs-Blatt* of the same date.

² *Verwaltungsbericht (Württemberg), 1892-93, p. 79.*

³ *Ibid.*, 1897-98, p. 96.

and inter-urban rates were the cheapest in Germany. Moreover in Wurtemberg a great part of the telephone traffic, outside of the local traffic in Stuttgart, is of the sort to profit by those reduced rates. In 1899 more than half of the purely local talks in the kingdom took place in the Stuttgart exchange area. Twenty-five per cent of all the telephone talks in the kingdom were toll messages. The more pressing needs of the Wurtemberg population for telephone service were indisputably well met.

Nevertheless the business men in the smaller places who did desire a local exchange service felt it to be unjust that they were compelled to pay the same flat rate as those in Stuttgart. The latter unquestionably received a far more valuable exchange service than could possibly be offered in the country towns and villages. The question of a reduction of the rates in country exchanges was first broached in the Landtag in 1897, but did not arouse much interest and no action was taken at that time. In 1899, however, the reform of the rates in the imperial service made it impossible to avoid giving the question more serious consideration in Wurtemberg. Petitions urging a similar differentiation of rates in favor of the smaller places were sent in to the Landtag by local business men in the rural cities. In response to these petitions the minister in charge of the telephone service declared that a further reduction of the rates was unnecessary in Wurtemberg.¹ However, after the reform had been adopted in the empire, he changed his mind and drew up a new schedule of rates to go into effect at the same time as the new rate in the rest of Germany.²

The Wurtemberg reform was of a less radical nature than the others. The flat rate was reduced in all exchanges with not more than 100 subscribers to 80 marks. Elsewhere it remained as before at 100 marks. The rate for branch stations was reduced from 50 marks to 30 marks, and for additional stations on the same premises as the terminal of a direct exchange line, from 50 marks to 25 marks. Finally, for the telephone stations used exclusively for suburban and inter-urban connections, the rate was reduced from 100 marks to 75 marks in Stuttgart, and to 60 marks elsewhere.

¹ In the sitting of the Landtag of June 6, 1899.

² *Verwaltungsbericht (Württemberg)*, 1899, Tabelle 30.

The latter reduction was the most important part of the reform in Wurtemberg, since it brought the greatest saving to that part of the community which was most in need of cheaper rates, and in that branch of the service in which lower rates were most justifiable. There was no introduction of message rates and no attempt at a fine graduation of the flat rates. The principle of flat rates was strictly adhered to even for long-distance service. The long-distance toll rates for communication with the rest of Germany were regulated, of course, by the imperial act of 1899. The domestic long-distance rate was revised on the same principle. The single rate of 25 pfennigs was withdrawn and a schedule of three rates of 10, 20 and 50 pfennigs respectively, according to distance, was substituted. Thus the toll rates were placed on a more rational basis. Beyond the liberal provision of public call offices,¹ no attempt was made to individualize the exchange rates.

¹ The first automatic public call office was established in Stuttgart in 1899. Others were established in the succeeding years.

CHAPTER X

THE RATE-POLICY OF THE GERMAN TELEPHONE ADMINISTRATION: THE INTRODUCTION OF MEASURED SERVICE

THE new rates went into effect at the beginning of the next financial year, on April 1, 1900. During the ensuing years the spread of the use of the telephone, both among smaller users and in smaller localities, was marked.¹ On March 31, 1906, there were 510,831 telephones in use in the imperial telephone area. Of these 218,470 were connected directly with a public exchange under a flat-rate contract, 132,490 were connected with private branch exchanges, and 151,967 were connected directly with a public exchange under a message-rate contract. Of the others, 3,121 were telephones used by public officials without charge, and 4,612 were public call offices within the urban exchange areas. The total number of telephones of all kinds on March 31, 1900, the day before the revised rates went into effect, was 195,078. Hence, the absolute increase during the six years had been about equally divided between the measured service and the unlimited service. But if the stations connected with private branch exchanges be deducted from those classed under the head of unlimited service, the increase of measured-service connections will be seen to have been much greater. During the first year after the new rates went into effect, the total increase in the number of direct exchange connections was 34,767. The number of such lines operated under the message-rate schedule at the end of the year was 45,131. Therefore assuming that the entire increase for the year took place under the message-rate schedule, there must have been over 10,000 telephone subscribers, or about one in sixteen, who changed during the course of the year from an unlimited to a measured service.

¹ Figures are taken from the RPT Ergebnisse, 1896-1900, 1901-05; and from the A. P. T., 1902, pp. 12-21: "Die Wirkungen der Fernsprechgebührenordnung." The annual statistical reports of the three German postal and telegraphic administrations have also been used.

At the end of the first year, under the new rates, more than one subscriber in five was a message-rate subscriber. Half a dozen years later the proportion was two in five.¹

In the Berlin postal district (which includes the metropolitan and suburban area known as Greater Berlin) the increase of telephone connections was divided between the direct and the private branch exchange service as follows:—

	<i>Mar. 31, 1901</i>	<i>Mar. 31, 1905</i>	<i>Increase</i>
Direct connections	39,949	63,107	58%
Branch-exchange connections	<u>13,104</u>	<u>35,531</u>	<u>171%</u>
	53,053	98,638	86%
Direct connections { Berlin city	36,098	49,017	36%
{ " suburbs	3,851	14,090	266%
Branch exchange connections { Berlin city	12,186	28,169	131%
{ " suburbs	918	7,362	702%

The effect of the modified private branch exchange rates was therefore greatly to stimulate the increased use of the telephone by residential subscribers. When it is further considered that the bulk of the increase of direct connections was in the form of the measured service, the impulse given to the extension of telephone service to others besides the commercial classes by the reform of 1899 becomes manifest. The rate of increase in the total number of telephones in use during the period 1900-1905 was no greater than that during the two previous quinquennial periods, but the distribution of the increase during the later period between the different classes of service affords abundant evidence of the utility of the reform of 1899 in adjusting the character and the price of service more accurately to the various needs of different individuals.

The success of the reform of 1899 was equally great as regards

¹ During the first seven years under the revised rates, *i. e.*, until March 31, 1907, the absolute increase of the flat-rate subscribers was from 166,134 to 238,812; that of the message-rate subscribers from nothing to 177,660. The increase in the number of stations connected with private branch exchanges was from 28,764 to 170,795.

the readjustment of the price of the service to the conditions in different localities. The total number of exchanges in the imperial telephone area increased between March 31, 1900, and March 31, 1907, from 1,220 to 4,402. A year earlier there were 4,062 telephone exchanges in operation. Of these 1,059, or more than one fourth of the whole number, contained less than five subscribers' lines. These were all, of course, in rural districts and had come into existence almost without exception, together with a great many others not much larger, since the reformed rates went into effect. The average number of telephones per exchange fell during the quinquennial period 1901-05 from 160 to 115. This fall took place despite the continued large increase in the large cities. In the rural districts, besides the increase in the number of small exchanges, the number of public call offices increased during the same quinquennial period from 12,147 to 17,335. That meant the inclusion of over 5,000 more isolated villages within the general telephone system of the land.

This, however, was simply the continuation of a policy already initiated at the time the reform of 1899 was first discussed. During the years 1898-99, Podbielski had established more than 11,000 public call offices in rural villages in order to bring them into communication with the nearest important exchange system.¹ The establishment of small rural exchanges had also been well begun before the end of the era of the single flat rate. During the quinquennial period, 1896-1900, four years of which elapsed before the reform went into effect, the number of exchanges in places with 2,000-5,000 inhabitants increased tenfold, and the number in places with less than 2,000 inhabitants increased from 27 to 897. The average number of stations connected with the exchanges in places with less than 2,000 inhabitants decreased from 21 on March 31, 1896, to 6 on the same day five years later. In these small exchanges, however, the local exchange service was of trivial importance in comparison with the long-distance service to the neighboring city.

A more vigorous policy of establishing public call offices was also inaugurated before the end of the era of the single flat rate

¹ Jung II, Appendix.

in urban districts with a view to making the service more accessible to non-subscribers. During the deliberations of the commission of the Reichstag in 1899, the telegraph authorities promised to establish at once 100 additional public call offices in Berlin and to display a similar activity in other cities. By March 31, 1906, there were altogether 4,612 such stations in the municipal telephone areas. When to these are added all the telephones with unlimited service which were placed gratuitously at the disposal of their patrons by the ubiquitous small eating establishments and tobacco stores, which form such a characteristic feature of German urban life, it will be seen that the small and occasional users of telephone service were tolerably well provided for in the urban districts. In the rural districts, where the chief use of the telephone was to establish communication with the nearest city, the new policy of establishing public call offices, combined with the reform of the rates, had brought an even more noteworthy improvement over the conditions that existed a decade earlier.

The first reappearance of discontent with telephone exchange rates was in Wurtemberg. In that state the reform of 1899 was received calmly enough by the commercial interests in the capital, but did not give satisfaction to the tradesmen in the rural districts. Their new rate, to be sure, was as low as any in the empire, but they wanted it lower. They still protested that they were paying much more proportionately to the value of their service than the subscribers in Stuttgart. Agitation in the Landtag was renewed.¹ Even the Stuttgart Chamber of Commerce was of the opinion that the small places were entitled to a larger reduction.² The telephone administration took the latter at its word and determined to increase the extent of the local differentiation in the exchange rate. In order to do this and avoid a deficit, the administration was forced to raise the rate in Stuttgart. This was more than the commercial interests of the capital had bargained for, and they raised a storm of protest.³ The Chamber of Commerce conceded that the administration was justified in securing an increase of revenue somewhere in order to compensate it for the anticipated loss in the

¹ See esp. debate in Landtag, sitting of June 30, 1903.

² HGK Stuttgart, 1902, p. 232.

³ *Ibid.*, 1904, pp. 193-202.

small places, but contended that the proposed reform would give it more than was necessary. The administration's proposals for the revision of the schedule of exchange rates were made in the summer of 1904. They were discussed by the *Beirat der Verkehrsanstalten* at its session of July 25, and approved with the qualification that the new minimum rate be extended to all exchanges with not more than fifty subscribers instead of only to those with not more than twenty, as provided by the original proposal. The telephone administration accordingly adhered to its plan, as thus amended, and put it into effect on April 1, 1905.¹ The new schedule was as follows:—

<i>Flat Rates (up to 3 kilometers from the exchange)</i> ²	
<i>In exchanges with not more than —</i>	<i>Mks.</i>
50 subscribers	60
51-100 “	80
101-1000 “	100
over 1000 “	120
The same in case more than 5000 messages are sent in a year	150

The effect of the reform was a reduction of 20% in the rates of the small exchanges, and an increase at a like per cent in Stuttgart. For all subscribers in Stuttgart, however, who used over 5,000 talks a year the increase was at the rate of 50%. The maximum increase applied on the basis of the figures of 1902 to 800 of the 6,000 subscribers in Stuttgart. On the same basis the reduction as proposed by the telephone administration would have affected 283 exchange systems, that is, more than the total number in the entire kingdom at the beginning of the same year. As actually carried into effect, the reform affected a great many more than that. At the same time, an innovation was made with a view to bringing about a closer accord between the rates and the needs of different users in the same locality. It was provided that any subscriber might have an automatic pay station installed on his premises instead of the ordinary instrument at the flat rate.

¹ *Amtsblatt der Kgl. Württ. Verkehrsanstalten*, Nov. 22, 1904.

² Extra line charged for at rate of 40 mks. per kilometer *per annum*, to be reduced to 20 mks. after 10 years.

This automatic station could be used like any public call office and at the same rates. The subscriber was required to guarantee that the receipts should not be less than the flat rate in force in the same locality. Under the conditions of urban and rural life in Wurtemberg this message-rate service is capable of playing a part in extending the use of the telephone among small tradespeople and householders like that of the party-line in America. It is the logical consummation of the public pay station policy of Wurtemberg administration.

These rates will probably satisfy the needs of telephone users in Wurtemberg for some time to come. Nevertheless, the maintenance of flat rates in each locality is bound sooner or later to cause dissatisfaction. The same motives which led to the discrimination in the rate schedule of 1905 against large users in Stuttgart must ultimately lead to the introduction of a schedule which will apply everywhere and which will be adjusted more accurately to the variations in individual needs. Doubtless the modest requirements of the bulk of the Wurtemberg subscribers make the flat rate at present a fairly reasonable basis of charge. Yet the inevitable tendency of flat rates to cause the lines to be overloaded and their failure to bring to the administration an increase of receipts in proportion to the increased use of the lines may easily cause the early substitution of a system of rates based on a more accurately measured service.

In the other parts of the empire, these defects in the principle of flat rates were not long in producing in certain circles a new spirit of discontent with the telephone exchange rates introduced in 1899. Thus in Bavaria, the Chamber of Commerce at Munich, in its first annual report after the reform went into effect, recognizing that the local commercial interests had been fortunate to escape an increase of rates, declined to indorse any of the complaints in regard to their height sent in by local business men.¹ But among these complaints, for which the Chamber assumed no responsibility, was one from the local guild of glassworkers. This guild declared that the reformed schedule had failed to do adequate justice to the small handicraftsmen, whatever the big business

¹ HGK Oberbayern, 1900, pp. 179-183.

men might think of it. The next year the same complaint was made by the local gild of blacksmiths and wheelwrights.¹ Again it was printed along with a few complaints of bigger business men, who still failed to read the signs of the time, without indorsement by the Chamber itself.² In general the large users now realized that no reduction in local rates could be made for the benefit of the small users without the abolition of the flat rates, and that would mean the loss of the advantages they had secured under the reform of 1899 by the introduction of the graduated schedule of flat rates.

In the imperial telephone service, also, the reform of 1899 failed to give permanent satisfaction. Temporarily, to be sure, the compromise of that year was accepted by all parties as a step towards a more rational basis of rates, with which it would be unseemly to quarrel. But as time passed, the smaller users generally, and in particular those in the rural districts, began to feel that they were entitled to more favorable treatment. The same methods of agitation were employed as before, and culminated in a resolution passed by two consecutive sessions of the Reichstag.³ This resolution requested the Chancellor "to undertake a thorough reformation of the telephone rates in the interest of the rural population, with a view to the fairer distribution of the burden of supporting the service between urban and rural subscribers."

The desire on the part of a portion of the telephone users to secure a reformation of the reform of 1899 was shared by the telephone administration itself. The principle of measured service rates which the administration had intended to make the basis of that reform was seriously impaired by the retention of the flat-rate schedule. In fact, after 1899, as before, the flat-rate service really characterized the German telephone system. To be sure, the method adopted in 1899 of graduating exchange rates according to the size of the exchange system secured to the telephone authorities one advantage. As the size of the exchange systems increased, the level of the rates would rise automatically. Hence they could afford to regard the unprecedented expansion of the

¹ HGK Oberbayern, 1901, p. 225.

² *Ibid.*, 1901, p. 301.

³ *Stenogr. Berichte des Reichstages*, reports of sittings of March 10, 1906, and May 3, 1907. Cf. Nr. 360 der *Drucksachen*, 1907.

exchange service with equanimity. Indeed this tendency probably worked more to their advantage than they had anticipated, for with the transformation to metallic circuits and the extension of underground construction the increase of the number of exchange subscribers ought thereafter to have brought a decrease in the average capitalization of the exchange system per subscriber. At the same time, the maintenance charges ought to have been materially reduced. But if the reform of 1899 had been actually carried out as originally planned by the telephone administration, the tendency towards an automatic increase of receipts would have been still greater. For under a system of flat rates the price of the service does not increase with the quantity. Hence the subscriber who greatly overloads his line not only encumbers the working of the line, but deprives the administration of its just recompense for the excessive service. Thus a number of subscribers, mostly bankers, department stores, expressmen, and restaurant and cigar storekeepers, who place their instruments at the disposal of their patrons, sent over 50,000 messages a year. In the year 1906 a flat-rate subscriber even carried on over one telephone line more than one hundred thousand local talks, or an average of over 300 on each working day of the year.¹ The original proposal of 1899 would have shifted the cost of these excessive talks to the shoulders of the other users in the same exchange area. The telephone administration was prevented from stopping this leak in its revenues by the refusal of the Reichstag to adopt its scheme of rates. In 1907 it welcomed the revival of agitation for reform because an opportunity was thereby afforded for another attempt to reach the big users.

The administration was able to make out a good case in favor of the total abolition of flat rates.² During the first seven years after the reform of 1899 went into operation, the number of subscribers had more than doubled. The number of telephones in use had trebled, but a considerable part of the increase was caused by the extension of the use of additional stations on direct lines

¹ *Denkschrift des Reichs-Postamts wegen Aenderungen der Fernsprechgebührenordnung*. Berlin, Dec., 1907, p. 2.

² Cf. *Denkschrift, passim*.

and of private branch exchanges. Yet the number of message-rate connections had increased much more rapidly than the number at flat rates. At the end of the financial year 1906 (March 31, 1907) the message-rate connections formed 42.7% of the whole. The former were used on the average 639 times a year, whereas the flat-rate connections on the average 3,117 times a year. Especially in the large cities the flat-rate lines were regularly overloaded. In Berlin the average number of calls per flat-rate connection per annum was 4,702 and in Hamburg was 5,505, whereas the number of calls on the message-rate connections was on the average only 629 and 612 respectively. Moreover, the average number of annual calls on flat-rate connections was rising steadily from year to year.

The effect was to produce an enormous discrepancy between the cost of a single call to flat-rate and to message-rate subscribers. In Berlin the former paid only 3.8 pfennigs, whereas the latter paid 21.4 pfennigs. In Hamburg the discrepancy was even greater, and in the other large and medium-sized cities it was not much less. In the entire imperial telephone service the flat-rate subscriber paid on the average 4.5 pfennigs a message, and the message-rate subscriber paid on the average 17.3 pfennigs. In the small places, moreover, both flat-rate and message-rate subscribers paid a higher rate per call than the average for the entire system. Thus, in exchanges having from 51 to 100 subscribers, the former paid 7.8 pfennigs, the latter 28.5 pfennigs. Finally, in the tiny exchanges with less than five subscribers, where only flat rates were available, the average cost per local call was 25 pfennigs, or more than the suburban toll rate in the large cities. There could be no doubt that under the existing schedules of rates a disproportionate share of the burden fell to the lot of the small users, especially in the small places.

The administration was also able to emphasize the evils of overloading the lines, caused by the temptation to which flat-rate subscribers were exposed to send as many messages as possible from one station. The result was that in the larger exchanges, in 1906, about 20% of all calls could not be effected because the lines of the parties called were busy. This overloading of lines hurt both

parties. The one who called up was subjected to the annoyance of being obliged to wait; the one who was called, to the risk of never receiving important communications at all. Many an impatient customer would go elsewhere rather than wait till his tradesman's line was free. This, to be sure, was not the fault of the telephone administration, but it considered itself justified in adopting a scale of charges that would not lead business men into this temptation. Moreover, the elimination of ineffectual calls would mean greater economy in the service at the central office. Subscribers themselves would avoid creating unnecessary work for the operators if their interest lay, not in sending as many messages per year as possible over their lines, but in sending no more than they actually needed. From every standpoint the abolition of flat rates and substitution of message rates was calculated to promote the more economical use of the telephone system and thus in the long run to reduce the expense of the service to the subscriber himself.

Furthermore the greatest obstacle to the early introduction of message-rates had been removed since the reform of 1899. It was no longer necessary to rely upon a manual record of the number of effective calls. Both in America and in Germany reliable mechanical devices had been invented which would record the number of talks accurately and cheaply. Thus there was no obstacle remaining to the introduction of charges for telephone service based more closely on its utility to the users, except the opposition of the users themselves. The telephone administration proposed, therefore, to accede to the request of the Reichstag and to undertake a thorough revision of telephone rates with a view to a more equitable distribution of their burden.

With this object it proposed to abolish flat rates altogether and to introduce a revised schedule of measured service rates. The ground rate was fixed on the same basis as the corresponding portion of the existing message-rate schedule. The message rate, however, was made degressive in order to make allowance for the more economical utilization of exchange-lines by the larger users. Under such a schedule the small and rural users would receive more favorable treatment than under the existing arrangement; for the saving that would result by charging the large users for

the full amount of their service was to be applied to a reduction of the charges for the smaller users and in the smaller districts. The telephone administration recognized that the general public welfare would be promoted by the utmost extension of the use of the telephone in the rural districts. Under the contemplated system they would receive specially favorable treatment. For the payment of the ground rate would entitle the subscriber to the connection with the exchange of a station anywhere within five kilometers of the central office without an additional mileage charge. In the existing state of the industry, the expense of constructing additional lines in the rural districts was often greater than in the urban, because it was not possible to utilize to such a large extent plant which was already in place. Beyond these concessions the administration did not propose to go with respect to discrimination between urban and rural subscribers. Its chief purpose was to adjust telephone rates as accurately as possible to the actual usefulness of the service to the subscribers wherever they might be situated. In short, the essence of the proposed reform of 1908 was the individualization of rates.

The actual proposal was as follows: all flat rates should be abolished. The ground rates of the existing measured service schedule should be reduced in each grade of the scale by 10 marks, and the requirement that at least 400 messages a year should be paid for at the message rate be withdrawn. With regard to exchange systems containing more than 20,000 subscribers, a further graduation should take place, so that for each 50,000 subscribers, or fraction thereof, in excess of 70,000, the ground rate should be increased by 10 marks. This increase was justified by the increase of the cost of service which, according to the memorial issued by the telephone administration,¹ would be produced in such large exchange systems by the growing complexity and expensiveness of the technical arrangements required actually to effect all the possible connections. At the moment no exchange system contained as many as 70,000 subscribers, but the time was not far distant when that number would be reached in Berlin. The existing message rate of 5 pfennigs should be retained for the first

¹ *Denkschrift*, p. 7.

2,000 messages originating at a subscriber's station, for the next 4,000 the rate should be reduced to 4.5 pfennigs, and for a further 4,000 to 4 pfennigs. Subscribers desiring to send more than 10,000 messages in a year should be required to install a second line. Thus at the same time the overloading of lines would be prevented and large users would receive some consideration for their greater patronage of the service.

The effect of this reform would be the reduction of the existing ground rate in all exchange systems and a reduction of the message rates on a part of the service of large users. Assuming that every telephone subscriber would make the same use of his line after the reform as before, regardless whether he had previously subscribed for an unlimited or a limited service, the administration estimated that the proposed changes would bring a real reduction in the cost of their telephone service to 60.5 % of all subscribers, and an increase to only the remaining 39.5 %. These latter were flat-rate subscribers under the existing system, and some of them would necessarily find the size of their telephone bill enormously increased. The administration declared, however, that this increase in reality would not be so great as might appear on the basis of their existing use of the service. For much telephoning was unnecessary and only took place because it cost the flat-rate subscriber no more to use his instrument lavishly than to use it sparingly. Thus, in 1900, as the result of the introduction of the optional limited service, so many subscribers chose to take advantage of the opportunity afforded by the latter to economize in the size of their telephone bill that the average number of talks per telephone was reduced for the entire imperial telephone system by 33%. In New York the transition from a flat-rate to a message-rate service was well under way in 1902, at which time the system was of about the same extent as the Berlin system in 1907. The effect in New York had been the immediate reduction of the average number of talks per line to 7.6 per day. In 1907 the average in Berlin was over 15 a day for flat-rate subscribers and barely 2 a day for message-rate subscribers. The administration estimated that the result of the abolition of flat rates would be a reduction of the average use of a subscriber's line in Berlin to about 7 talks a day, or in the im-

perial telephone service as a whole by 40%. In other words, the administration broadly hinted that the big users could keep their telephone bills within reasonable limits under a system of message rates by means of a reasonable economy in their use of the service.

Besides the abuse of the flat-rate service, there was another cause of leakage in the revenues of the telephone administration. In 1899, when the schedule of long-distance rates was revised, no provision had been made for a graduation of rates for distances in excess of 1,000 kilometers. At that time it was not necessary. But it was not long before the long-distance traffic over greater distances than were contemplated in 1899 attained considerable proportions. It was found that the cost of rendering the services over the longer distances increased significantly. For one thing, wire of greater thickness had to be employed in order to maintain a satisfactory standard of audibility over the longer distances, and this alone was sufficient to cause a noteworthy increase in the expense of establishing such service. The result was that direct long-distance business between the more remote cities was being carried on at a loss. The administration accordingly proposed to graduate the entire schedule of long-distance rates on the basis of stages of 250 kilometers each, and to readjust the rates on that basis. The effect would be to confine the existing rate for the stage between 500 and 1,000 kilometers (50 marks) to the stage between 500 and 750 kilometers. The rate for all distances in excess of 1,000 kilometers (2 marks) would be applied thereafter to the stage between 750 and 1,000 kilometers, and the proposed rate for greater distances increased by 50 pfennigs for each further stage of 250 kilometers. By way of compensation for these increases it was proposed to create a new stage for the lines between 100 and 250 kilometers in length. Within this stage, in which would fall many important long-distance connections, the administration proposed to reduce the existing rate from one mark to 75 pfennigs. The rates for shorter distances were to remain unchanged.

These increases in the long-distance rates would apply to the traffic with Bavaria and Wurtemberg, as well as within those parts of the empire included in the imperial postal and telegraph area. Representatives of the telephone administrations of those

two South German states accordingly took part in the work of framing the new schedule. The Bavarian administration, moreover, took advantage of the opportunity to reform also its exchange rates. These, it will be remembered, had been framed at the time of the reform of 1899 with a view to favoring the smaller localities and users without increasing the cost to the big users in Munich. Hence, throughout the upper stages of the schedule the flat rates were lower than in exchange systems of corresponding size in the imperial service. The result was that the Bavarian administration was unable to make both ends meet. The financial state of its telephone business could not be determined with accuracy on account of its union with the postal and telegraph services, but as careful an examination of the posture of affairs was made as the circumstances would permit.¹ This examination showed that the receipts from the local exchange business, after payment of the operating expenses, including the cost of maintenance and renewal of worn-out plant, and interest at the rate of 3.5 % on the capital invested in exchange construction, yielded a surplus of 100,000 marks a year. If the same rates had been in force as in the imperial exchange service and the local traffic had been nevertheless the same, this net surplus would have been three times as great.

But this small surplus was more than wiped out by the deficit in the long-distance branch of the business. In this service the current receipts did not even cover the ordinary operating expenses, to say nothing of interest and depreciation. The long-distance rates were the same as in the imperial telephone service, but in Bavaria, as the telephone administration took some pains to point out,² industry was less highly developed and the commercial activity less lively than in the imperial telephone area. The predominantly agricultural population did not utilize the long-distance facilities so economically as would have been the case with an industrial population. The fixed plant had to lie idle a greater portion of the time in order to be available when it was

¹ "Neuregelung der Telefongebühren," *Verkehrsministerialblatt für das Kgh. Bayern*, 1908, No. 2, pp. 7-21. (Jan. 3, 1908.)

² *Ibid.*, p. 15.

needed. Moreover in Bavaria the duration of a long-distance talk was five minutes, instead of three, as in the imperial telephone service. Finally, a flat-rate service was maintained for suburban and inter-urban communications which was operated at a formidable loss. The kingdom was divided into eight administrative districts, throughout the entire extent of each of which unlimited communication was granted for a payment of 50 marks, in addition to the ordinary local exchange rate. This was analogous to a similar service that had long existed in the imperial territorial service, but on a far less extensive scale. In Bavaria this service had been limited in 1902 to 1,000 messages at the flat rate, and an additional charge was imposed of 10 marks for each further 100 talks. This charge aroused, of course, much opposition at the time from the interests adversely affected, but was nevertheless maintained.¹ Yet it failed to make up the deficits on that branch of the service. In 1906 the average compensation received by the telephone administration for such flat-rate long-distance traffic was barely 10 pfennigs per message, whereas the lowest long-distance toll rate was twice as great. The result was a deficit of a quarter of a million marks on the long-distance service, without taking into account the fixed charges. This deficit converted the small surplus that was derived from the exchange business into a considerable loss on the operation of the whole telephone undertaking.

This special statement by the telephone administration cannot easily be verified by an independent examination of its published annual reports.² The total receipts of the combined postal, telegraph, and telephone services in the financial year 1906 were 51,349,145.16 marks. The total expenditures were 42,167,234.21 marks. The surplus was 9,181,910.95 marks. This was the most favorable showing which had ever been made since the establishment of the telephone business. Yet the surplus is reckoned without making any allowance for fixed charges, that is, for the interest on the capital invested in the plant required to render the service and the contributions towards the sinking funds required for its

¹ HGK Oberbayern, 1903, pp. 76-79.

² Cf. *Statistischer Bericht über den Betrieb der Kgl. Bayer. Posten und Telegraphen im Verwaltungsjahre 1906*, p. 3.

amortization. The Bavarian statement shows an operating ratio of 82.1 %, which is higher than sound undertakings of a similar sort are in general able to work under. According to the published statement, 19.3 % of the gross receipts of the combined service were derived from the telegraphs and telephones alone, but of the total current expenditures 74.9 % were ascribed to the joint account of the combined postal, telegraph, and telephone services. Hence, the public is not able to judge of the position of the telephone business separately. But the total capital expenditure for the construction of telegraph and telephone plant is stated to be 61,452,021.83 marks at the end of the financial year 1906. On this interest is paid at the rate of 3.5 % out of the general funds of the government. The allowance that should be made for depreciation over and above the expenses of maintenance is not easy to ascertain. Different kinds of plant wear out at different rates of speed. Underground cable will last a long time. Switchboards, on the other hand, are comparatively short-lived. The rate of depreciation, like the expense of maintenance, ought to be computed separately for each class of apparatus. The average life of telephone plant is not the same in different localities under different standards of construction. Moreover, telephone plant is liable to become obsolete before it is worn out, and must then be replaced by more efficient equipment. The Chicago Telephone Commission of 1907 estimated that a reasonable allowance for depreciation under the conditions prevailing in Chicago was 8 % per annum of the capital value of the plant. This allowance probably would not be far wrong for the Bavarian telephone system.

On this basis, the total fixed charges of the Bavarian system in 1906 may be computed at 11.5 % of its capital-expenditure. This basis of computation may be employed with the more confidence since under public ownership there is a greater probability of correspondence between the stated capitalization and the actual quantity of capital invested in the plant than there is in the case of a private corporation. Hence the margin of error is smaller. On this basis, then, there should have been an allowance for fixed charges in the Bavarian telegraph and telephone undertaking in 1906 of over 7,000,000 marks. Such an allowance more than wipes

out the share of the surplus on the combined postal, telegraph, and telephone services, that should be ascribed to the latter branch of the undertaking, on the basis of the proportion of the gross receipts that is derived from the operation of the telegraphs and telephones. Unquestionably, regarded as a commercial undertaking, the Bavarian telegraph and telephone business is unprofitable. In what proportions this loss is distributed between the two branches of the undertaking cannot be ascertained from the ordinary published reports, but there is every reason for believing that the special statement of the telephone administration in regard to the proposed rate reform of 1908 is correct.

In Bavaria the unprofitableness of the telephone service had been recognized for some time by the Landtag. On divers occasions during the discussion of the postal budgets, representatives have criticized the administration because its telephone undertaking was not conducted on a sound financial basis. The ultimate result of the discussions in the Landtag was the passage of a resolution at the sitting of August 13, 1906, requesting the Bavarian government, "in conjunction with the imperial postal and telegraph administration, to introduce as quickly as possible a reformation of telephone charges on the basis of message rates."¹ Accordingly the Bavarian coöperated with the imperial authorities in the preliminary work of revising the schedule of rates. The proposed reform was announced in both the imperial telephone area and Bavaria at the end of 1907.

Before bringing its proposal into Parliament, the German telephone administration laid it before a special meeting of the representatives of the various economic interests of the empire. This conference took place January 7, 1908, at the imperial headquarters in Berlin, and was attended by seven delegates from each of the central organizations of agriculture, the handicrafts, industry, and commerce.² In this conference, the effect of the pro-

¹ Cf. *Statischer Bericht über den Betrieb der Kgl. Bayer. Posten und Telegraphen im Verwaltungsjahre 1906*, p. 16.

² Invitations to send delegates were sent to the *Deutscher Handelstag*, the *Deutscher Landwirtschaftsrat*, the *Handwerkertag*, and the "Vertretung der Industriellen." Cf. Staatssekretär Kraetker's declaration in the Reichstag, Feb. 14, 1908.

posal was thoroughly discussed from the different standpoints of the various interests to be affected. The inevitable clash between urban and rural districts produced a discussion that lasted from 10 A. M. until 7 in the evening. The proposals had to be modified in some respects in order to secure the support of a majority of the delegates, but in a slightly amended form were eventually adopted despite the protests of the minority. The final result was duly reported in the next ensuing editions of the official organs of the various interests in attendance.¹

The long-distance rate of 75 pfennigs for the new stage of 100 to 250 kilometers was universally welcomed and more than compensated for the increase of the rates for the higher stages. On the other hand, the conference almost unanimously declared the proposed reform of the exchange rates unacceptable unless the message rate were reduced to the uniform level of 4 pfennigs a talk. A strong minority, moreover, though recognizing the injustice of flat rates in their existing form, declared itself to be opposed to their total abolition. They desired that flat rates be retained in the form of a schedule, graduated not only as at present in accordance with the varying size of different exchange systems, but also in accordance with the differences in the utility of the service to large and small users in the same exchange system. The administration, however, was determined that flat rates should not be retained in any form. In order to secure a majority for its plan, it not only consented that the message rate should be reduced to a uniform basis of 4 pfennigs for all messages, but conceded the establishment of a new class of exchange systems containing those with less than 500 subscribers. For this class the ground rate should be still further reduced by 10 marks. On this basis the administration's plan of reform, including the total abolition of flat rates, received the assent of the majority of the conference.

Thus the preliminary victory was gained by the rural interests. The preference to be accorded them was even greater than originally contemplated by the administration, for not only was the ground rate in the smallest exchanges reduced twice as much as

¹ See esp. *Allgemeine Handwerker-Zeitung*, Jan. 11, 1908; cf. also *Zeitschrift für Agrarpolitik*, 1908, p. 34. See also A. P. T., 1908, p. 143.

had originally been planned, but also the message rate was reduced for the first 2,000 talks as well as for those in excess of that number. The attempt of the big users to save a part of the advantages that accrued to them under the existing flat-rate schedule by an appeal to the small users in the same locality was too transparent. No conceivable schedule of rates, which would enable the large users to obtain their telephone service for less than would be the case under the new schedule proposed by the telephone administration, could enable the small users to obtain their service also for less. Within the limits of the total receipts anticipated from the telephone administration's proposed rates, it was not possible to alter that proposal to the advantage of one party without putting the other in a less favorable situation. The representatives of the handicraftsmen were wise enough to perceive this. It was therefore with their help that the agricultural interests secured such a sweeping victory.

The big users did not accept the defeat as final. They announced their intention of fighting the reform in the Reichstag, and started at once to organize public opinion against the total abolition of flat rates. They directed a memorial to the imperial telephone authorities protesting against the proposed reform, which was signed by eighty-four commercial associations of the German capital.¹ The authors of this memorial pointed out, first, that the result of the proposed change would be an enormous increase of the charges for telephone service in Berlin. Taking the average number of daily talks over the lines of flat-rate subscribers in Berlin as 16, the average annual charge on the basis of the proposed message rates to such users would be 334 marks, or an increase of 85%. To certain classes of users it would be much more. For example, the average increase to members of the *Verband Berliner Spezialgeschäfte* would be 285%.² The authors of the memorial did not attempt to argue that these users should not be required to pay more than they were then paying. Their point

¹ *Zur Frage der Reform der Telefongebühren. Eingabe des Vereins Berliner Kaufleute und Industrieller und des Zentral-Ausschusses Berliner kaufmännischer, gewerblicher, und industrieller Vereine an den Staatssekretär des Reichspostamts.* Berlin, 1908. Cited as Berlin Eingabe.

² Berlin Eingabe, p. 17.

was, either that such an enormous increase was unnecessary, or, in case the estimate of the telephone administration were correct, the introduction of its proposed schedule of rates would in fact defeat its own purposes.

The administration based its calculation on the effect to be produced by the contemplated reform on the assumption that the total yield of the telephone service should not be greatly altered.¹ It started with the statement that the existing financial condition of the telephone service was satisfactory. Although it did not profess to be able to compute with accuracy the actual profit on the telephone branch of its undertaking, yet it could state confidently that both exchange and long-distance business yielded a moderate surplus. After deducting from the gross receipts all operating expenses plus the charges for maintenance and for the renewal of worn-out plant as well as interest at 3.5% on the capital which had been invested, this net profit amounted to about 10,000,000 marks on an entire investment of over 400,000,000 marks, and was derived in about equal proportions from the exchange and the long-distance services. This profit the administration did not regard as unreasonable in view of the facts that the telephone business was an uncertain one and subject to unpredictable disturbance by the progress of invention, that consequently wise public policy required the gradual extinction of the loans incurred on account of construction, and that the administration was entitled to some compensation for the deficits on the telegraph service, especially as both services were patronized by the same classes in the community. Finally, the financial conditions of the empire (for some years the German government has regularly failed to make both ends meet) forbade the adoption of a rate-policy that would throw any part of the burden of supporting the telephone service on the shoulders of the general taxpayer.

In estimating the yield of the proposed schedule of rates, the administration was forced to take into consideration its probable effect in diminishing the number of calls which would be sent under the message-rate schedule by the former flat-rate subscrib-

¹ Denkschrift, 1907, pp. 6-9.

ers. The administration estimated, as has already been stated, that this effect would be the reduction of the average number of talks per line in the empire as a whole by 40%. On this basis the gross receipts from the telephone service would be increased by the introduction of the proposed rates from 79,000,000 to 80,000,000 marks. This calculation would be affected by the alterations which were made in the administration's proposals at the preliminary conference with the representatives of the various economic interests. Yet the proposal must have been framed with a view to leaving some latitude for later concessions. Unless that were the case the administration could not have made those concessions without imperilling the financial soundness of its undertaking and thus, as the authors of the memorial pointed out, defeating its own purposes.

These calculations, however, are open to criticism at several points. If the effect of the proposed reform would be to cause such a diminution of the use of the telephone as the administration anticipated, it ought to bring with it appreciable savings in the cost of performing the service. But the administration made no allowance for such savings. On the other hand, if the anticipations of the administration were not realized, there would be a corresponding increase of receipts on the basis of the existing level of expenditures. In either case, the net profits after the reform would be greater than according to the administration's estimate. Furthermore, the inevitable future growth of the telephone service would bring with it an increase of receipts. The administration had anticipated the latter criticism by the statement that the cost of rendering the service increases with the increase in its magnitude and complexity. But the commercial interests could justly retort that the administration had made public absolutely no data which would support such a statement.¹ Finally, the published German telephone accounts do not make it possible to distinguish between that portion of the expenses of maintenance which should properly be charged to operating expenses and that which should be charged to the capital account. Consequently, the administration might defray what ought to be capital expenditures out of current re-

¹ Berlin Eingabe, pp. 27-28.

ceipts. Such a policy would tend to conceal the true rate of profit on the undertaking.

The effect of the proposed schedule of rates, it was argued, would be the conversion of the telephone undertaking into a source of revenue for the imperial government. The question of the wisdom of such a fiscal monopoly is one of public finance. The telephone is an undertaking, the benefits of which to individual members of the community can be separately and accurately measured. Different classes of the community, moreover, share in these benefits in unequal proportions. Since the classes which make the most use of the service are also those which are most able to bear its burdens, there is no reason why the latter should be shifted to the community at large. A governmental telephone undertaking should, therefore, be self-supporting. Whether it should be more than self-supporting, is a question of fiscal expediency which cannot be answered without taking into consideration the alternative sources of revenue which at the given time and place are available. In general, a government should be extremely reluctant to levy a tax on an instrument of public communication, especially on one like the telephone, which is destined particularly for the transmission of intelligence. To the extent to which such a tax would fall on the shoulders of the business community it is open to the same objections that apply to all taxation of the agents of production. The German imperial government is unquestionably hard pressed for new sources of revenue. In view of the actual political state of Europe, the best way of establishing a balance between income and outgo — the reduction of military and naval expenditures — is not open to it. The almost intolerable burden of preparing for war in time of peace has brought, and is still bringing, disorder and confusion into the financial administration of almost every important European government. Under the existing conditions there is no help for that.

The German government was charged with aiming to convert its telephone undertaking into a fiscal monopoly even under the rate schedule of 1899.¹ It is doubtful, however, if the level of rates established at that time was higher than was required in order

¹ Schwaighofer, *Grundlagen der Preisbildung*, pp. 80-81.

to earn a reasonable profit. The Bavarian schedule, which was not so very much lower, did not bring in a reasonable profit. The evidence on which a reliable judgment can be based has not been made available to the public. It seems very probable, however, that the proposed reform of 1908 would, if adopted in its original form, have enabled the government to obtain a not inconsiderable net revenue from its telephone undertaking. The problem of the best disposition of such a profit in the interests of a community at large is an extremely complicated one. Its solution depends, on the one hand, on the incidence and relative weight of the monopoly profit as compared with the alternative sources of additional revenue that are available, and on the other, on the satisfaction that could be derived by re-investing the monopoly profit in the telephone business, or remitting it to the users in the form of reduced rates. The solution of this problem is like the trying on of a new shoe. That shoe is first tried on which seems likely to give the most general satisfaction. Then later changes are made where the first shoe pinches.

A more fundamental point was raised by another criticism which was directed against the proposal of 1908 by the representatives of the large users.¹ The measurement of the utility of telephone service on the basis of the number of messages is more just, it was urged, in appearance than in reality. For who can tell what value is set upon a message by its sender? To one it is high, to another low. Doubtless many messages of trivial importance are sent over the wires of flat-rate subscribers. Nevertheless, in the opinion of the authors of the memorial, that was not the habit of business men. Their time was too valuable to be wasted in idle talk. In fact, the telephone had become such an indispensable factor in business life that its use could not be curtailed. Hence the large users would pay the whole of the increased cost of telephone service that would be produced by the proposed reform on the basis of their existing use of the service, rather than cut down the size of their telephone bill by dispensing with any portion of their telephonic communication.

If this prognostication be correct, certain deductions may be

¹ Berlin Eingabe, pp. 12, 21.

drawn from it which the commercial interests would be the last to welcome. The statement could be true only upon the hypothesis that the large users were then paying less than the service was felt to be worth, and that under the proposed rates they would not be called upon to pay more than its actual utility. Unless this were so, they would cut down their use of the service. Now the large users were numerically decidedly in the minority even in the large cities. Thus, during the year 1907 the distribution of telephone traffic among the subscribers to the Berlin exchange system was as follows:¹ 42% of the total number of subscribers used less than 3,000 calls; 28% used between 3,000 and 5,000; 25% used between 5,000 and 10,000, and only 5% used over 10,000. Even if a universal reduction of rates would call forth as much new business proportionally to their numbers among large users as among small, the increased use of the telephone would bring a greater total amount of satisfaction to the latter than to the former. For the fresh traffic called into existence by a given reduction of price must possess the same final degree of utility wheresoever it may originate. The total amount of fresh traffic which could be called forth by a given reduction of price would be greater among the small than among the large users. In fact, a reduction of price to the big business users of the telephone service probably would not call forth, even proportionally to their numbers, so great an increase of traffic as among smaller users. In any case, by charging the former more nearly in accord with the utility of their service, a considerable increase of revenue would be obtained which could be applied to the extension of the telephone service in rural districts and amongst small users everywhere.

Moreover, the expense of rendering the service in the large cities is greater than in the country districts. Hence, the expenditure of equal sums of money would maintain a more considerable quantity of telephone facilities in the latter than in the former. Thus the application of all surplus profits that could be obtained from the large urban users to rural extensions would greatly increase the utility of the telephone to rural users. Since

¹ *Berliner Tageblatt*, Feb. 13, 1908.

the winning of these surplus profits, according to the authors of the memorial, would not cause a diminution of the use of the service by the urban users themselves, such a policy from the point of view of the community as a whole must be regarded as highly commendable. Even if it should cause a decrease in the use of the service by the large users as anticipated by the telephone administration, this corresponding diminution of the utility of the service to large users would be more than counterbalanced by its increased utility to small and rural users.

It was this policy which in fact underlay the proposals of 1908.¹ Indeed, it seems to have been initiated before that date by direct administrative action. The representatives of the telephone administration declared at the conference of January, 1908, that already the annual expenditures for exchange systems having less than 300 subscribers were in excess of the receipts from such systems.² Be that as it may, the proposals of 1908 are an open declaration that the purpose of the German telephone administration is so to adjust its rates for telephone service as to secure from it the maximum of utility to the community as a whole. In order to do this, the administration will, if necessary in order to bring the cost of service in the same relation to its utility for all classes in the community, charge certain classes of telephone users a higher price for their particular service than would be required to maintain that particular service alone independently of the collective service of the community at large.

Thus the ownership of the telephone business by the German government enables it to establish the rates with a view to the promotion of the general welfare. If the German telephone industry to-day were thrown freely open to private enterprise, it is possible that competitive exchange systems would be established in the large cities and that rates would be reduced for large users. For the present urban exchange rates in large cities are based on the utility, not on the cost of the service. But no private business man would establish telephone undertakings in the rural districts. For the business is already being conducted for less than cost in those districts. The government, however, would speedily

¹ Berlin Eingabe, p. 30.

² *Ibid.*, p. 23.

be deprived of the monopoly profits which are earned in the large urban areas, and would have to abandon the rural business or carry it on thereafter at the expense of the general taxpayer. On the other hand, if the telephone business had been confided from the beginning to a private monopolist, and if the monopolist had intelligently pursued his own interest, he also would have established the rates in large urban exchanges on the basis of the utility of the service, but he would not have extended the service to the rural districts as freely as the government has done, and where he did enter the rural districts, he would not have established such low rates as the existing government rates.

The withdrawal of the arbitrary power over rates from the hands of private business men has had the further advantage that it has entirely prevented the nuisance of personal discrimination. The vesting of the complete control over rates in the hands of the government has the disadvantage, however, that it opens the door to local or class discrimination. Such discriminations in the making of rates in public business undertakings is but one aspect of the danger which is always present in governmental action, the danger of the tyranny of the class that controls the government over the rest of the community. In popular governments this danger takes the form of oppression of the minority by the majority. The only safeguard against the abuse of power by those in authority lies in the good sense and innate justice of those who constitute the source of authority. "If the salt hath lost its savor, wherewith shall it be salted?" The German telephone rate-policy has been by no means wholly above criticism. It is not in the nature of human policies, no matter how wisely devised, no matter with what sagacity and devotion to the common weal they may be administered, ever to be wholly above criticism. Yet despite the flaws in the record of their telephone rate-policy, the Germans cannot be denied the praise of having established a more reasonable schedule of rates than would have been established under a régime of private enterprise.

CHAPTER XI

THE LABOR SITUATION IN THE GERMAN TELEPHONE SERVICE

AN important economic question still remains, namely: how has the state employer dealt with the labor situation in the telephone service? This question carries the inquiry out of the realm of production, strictly speaking, and into that of distribution. The term distribution denotes the process by which the remuneration of the several agents of production is determined. The remuneration of the wage-earners includes the command over the desirable commodities of life, which the worker obtains by virtue of his wage or salary, and also his command of leisure in which to enjoy them.

In this branch of the inquiry the temptation is strong to compare the conditions of labor in different countries. On the ground of such a comparison, it might be argued that, since the employees were better situated as regards wages and hours of employment in one country than in another, the form of industrial organization or the character of business management was better in the one than in the other. Or from the same premises it might be argued that the one set of employees had greater cause for satisfaction with their lot than had the other. Such comparisons have in fact been made.¹ They are, however, likely to be misleading. The remuneration of labor of similar grades at any moment varies greatly from place to place. Many causes conspire to prevent all workmen in the same grade of employment from offering their services in the same market. While these obstacles to free international competition for employment endure, there can be no standard universal rates of wages for the various grades of employ-

¹ Jules Walter: *Les Administrations postales et télégraphiques*. 10 fascicules. Troyes. 1902-03. The author's conclusion was that the French postal and telegraph employees had less cause for dissatisfaction with their lot than had those in any other of the ten European countries, in which he compared the wages and conditions of employment. To the present writer it seems wholly misleading to draw such conclusions from such premises.

ment. The differences that may be ascertained between the remuneration of labor in different countries indicate, more than anything else, differences in the efficiency of labor in those countries. The most profitable comparison therefore that can be made, with a view to estimating the effect of public ownership on the distribution of wealth, is one between the position of governmental employees and private employees of similar position in the economic scale in the same country. Such a comparison would require a minute study of the general conditions of labor in the several countries, and would be a task wholly beyond the purpose of the present investigation.

It will not be uninteresting, however, to compare the relations between employer and employed under governmental and private ownership. Next to the actual conditions of employment in a given occupation, the most important consideration affecting the lot of the employed is the facility of securing changes in the actual conditions in response to changes in the productiveness of labor and in the general situation of the working-classes. In the long run the relation between employer and employed is probably an even more important factor in the welfare of the latter than is their particular wage at a fixed moment. The matter is no less important from the point of view of the employer.

At first thought it might seem that there could be no conflict of interest between employer and wage-earner in a governmental business undertaking, and that there should be therefore no incentive to the organization of governmental employees into associations for the purpose of safeguarding their economic interests. The entire staff of a public business undertaking, the director, the highly trained technical experts, the clerks, and the unskilled manual laborers are equally the servants of the state, and the state is nothing more nor less than the sum of its citizens, whatever be their position in the economic scale. The various grades of hand- and brain-workers required to carry on a public business undertaking are accordingly in a sense their own employers, or at least have the same share in shaping the conditions of their employment as in directing any other branch of governmental activity. Wage-earners in the employ of the state would, apparently, be

forced to improve their lot through some form of political action. The forces which have produced trade-unionism among wage-earners in private industry might be expected, therefore, to produce a political party, representing the public employees of all ranks, in opposition to all other political parties, representing the community in its capacity of owner of public undertakings.

In practice this has not happened. In no continental country do the employees of the state constitute a body of sufficient numerical importance to be able to wield a decisive influence in party politics. If the two-party system prevailed on the continent, it might conceivably be possible for an organization of public employees to secure the balance of power, and give their support to that one of the two rivals which would grant them the greatest favors in return. But the two-party system does not exist there. The two-party system, in itself an unnatural mode of expressing the wide range of diverse economic interests and political ideas which exist in every large community, is a peculiar product of Anglo-Saxon political evolution, and is maintained in its artificial rigidity by political practices and special legislation, which the continental peoples do not now possess and have no desire to imitate. In order to exercise any appreciable influence on the policy of the government, the public employees must act in accord with that one of the parties of the day which is most in sympathy with their particular political views. In Germany this party is the Social Democracy.

There is another reason for the absence of an independent political movement on the part of the employees of the state. The state which engages in business undertakings really assumes a double task. In its capacity of political organization of the community, it comprises both employer and employed; but in its economic capacity of business man, it is employer alone. But the state as such can act only through the agency of individuals, one or more of whom must be set apart from the rest in order to perform a particular function. In practice the public business man function is distributed among a variety of individuals and organizations, one of which, however, must necessarily be intrusted with the task of directing the wage-earners employed by the state.

Such a director of a governmental undertaking feels the responsibilities of his position. He holds a great trust on behalf of his employer, the state, and can scarcely fail to assume the authority towards the employees that is necessary to exercise such a trust, according to the notions current round about him among employers in private industry. He will be master in his own house, as the German employers are fond of saying, and will not tolerate interference in his conduct of affairs by those subjected to his control. In the mental make-up of such a public business manager, there may also be an admixture of that trait of human nature which sometimes leads those in authority to oppose their will to that of their subordinates, simply to show that they are in authority. The greater the distance in the economic scale between the director and a particular group of public employees, the greater the temptation of the former to display his authority, and, according as the employees of the state stand near to or remote from the source of authority, will their sympathies incline towards or away from the efforts to maintain it.

Finally, a variety of causes, historical and economic, have brought it to pass that the state does not treat all its employees alike. Not only are the wages of the different classes of employees unequal, but also their hours of employment, and, most important of all, their tenure of their positions. The higher grades of employees enjoy a greater certainty of employment than do the lower, and the expectation of more generous treatment in case their services have to be dispensed with, either on account of advancing age, disability, or any other cause. The differences in the conditions of employment of the different grades of governmental employees are the result of the differences in the customary treatment of similar grades of service in the competitive labor market, of the more sudden and wider fluctuations in the demand for unskilled than for skilled and highly specialized workers, and of the fact that when governments first began to go into business on a large scale they extended the principles of employment that had long been applied to political departments to the category of pure business undertakings, thus extending in the economic field the political distinctions between those in authority and those in

subjection to authority. An almost military code of discipline grew up in public business undertakings, which made it an easy matter for the public business managers to maintain over the wage-earners in the employ of the state an authority far more rigid than that which the private captain of industry was ever able to assert.

Under these circumstances the growth of a collective consciousness among the various classes of employees of the state has been no less rapid than among corresponding classes of wage-earners in private employment. This fact has weakened the force of any independent political movement which public employees as a body might have inaugurated, but has strengthened the incentives to the formation of trade-unions. At the same time the confusion of political and economic authority in the hands of the managers of governmental business undertakings has strengthened the power of the latter to oppose trade-union action, and shifted the balance of power between employer and employee, greatly to the disadvantage of the wage-earner in the employ of the state as compared with his mate in private employment. Consequently we should expect to find the same spirit of association among the former as among the latter class of wage-earners, but we should not expect to find the progress of trade-unionism so rapid.

The breaking-down of the community of interest between public employees as a body and the strengthening of the bonds of sympathy between the various classes of public employees and the corresponding classes in private industry has been promoted by the legislation of the imperial government and by the administrative policy of those in authority since the establishment of the empire. Germany is not a democratic country, either in principle or in practice. The policy of Bismarck was to tolerate the efforts of the working-classes to improve their position by collective action until those efforts appeared on the point of becoming important. It was not in the Bismarckian scheme of things that the working-classes should become an important factor in the direction of the destiny of the empire. Under the code of blood and iron the working-classes were expected, not to command, but to obey. Hence (1878) the occasion of two mad attempts by irre-

sponsible fanatics to assassinate the Emperor was seized for the purpose of suppressing altogether the independent political movement of the laboring-classes.

The special legislation against the Social Democracy incidentally blotted out the trade-union movement among the German working-classes, but it could not suppress the mental activity of wage-earners as individuals. In 1881 Bismarck issued the famous message in which he laid down his plan for the destruction of the foundation of the independent working-class movement through the great scheme of imperial workmen's insurance. But Bismarck had reckoned without his host. What the German working-classes wanted was not simply liberty to eat, drink, and be merry, under the auspices of a state in which much might be done for them but nothing by them, but liberty to take part in the shaping of their own destinies. The lapse of the special legislation against the Social Democracy in 1890 was followed by an unprecedented growth both of the Social Democratic party and of trade-unionism.

In the same year (1890), under the enthusiastic leadership of the young Emperor, the imperial government laid down a fresh program of legislation on behalf of the working-classes. The ringing message of February 4 was followed by an international conference for the protection of the wage-earners of all countries, and this by the replacement of the Iron Chancellor by a man more in sympathy with the new policy. But the international conference was barren of practical results, the new Chancellor was unable to overcome the resistance, active and passive, of the conservative forces that had so long controlled German politics, and within half a dozen years the fall, first of Count Caprivi, then of Baron von Berlepsch, marked the exhaustion of the impulse to social reform given by the accession of the second William.

One article of the proposed scheme of reform, laid down in the imperial message of February 4, 1890, is worthy of more than passing notice. This was the declaration that governmental employment should be model employment.¹ This statement appears on its face almost self-evident. In reality it was revolutionary. In the first place it was contrary to all precedent. Bis-

¹ *Staats- und Gemeinde-Betriebe sollen Musterbetriebe sein.*

marck's measures for the improvement of the condition of the working-classes, particularly his great scheme of workmen's insurance, had been intended to apply, and in fact did apply, to all wage-earners alike, regardless of the status of their employer. In the second place, the deliberate discrimination between wage-earners in the employ of the state and those in the employ of private employers was certain to arouse discontent among the latter class of wage-earners. They would be incited to demand similar treatment from their employers, and the latter could not well refuse, if they would avoid strikes. In either event the action of the state in setting up in business as a model employer would tend greatly to unsettle the relations between capital and labor, and to disturb the conditions under which private business would have to be carried on. The relations between the state employer and its wage-earners from this moment on, therefore, deserve especial attention.

The policy of the German government towards its employees had always been a matter of importance. The business undertakings carried on by the Imperial Chancellor in his capacity of chief of the administration, not only of the empire, with its postal and telegraph system, but of the kingdom of Prussia, with its system of governmental railroads, the largest in the world under a single management, to say nothing of numerous lesser undertakings, made him by far the greatest employer of labor in the world. Hitherto, however, that policy had possessed nothing to distinguish it from that of other great employers, the Krupps, for instance. Both alike refused to deal with their employees except as individuals. Both alike established welfare institutions for their employees, actuated, partly no doubt by humanitarian impulses, but partly also by a desire to gain a stronger hold over their loyalty than could be secured by the prospect of uncertain employment alone. In neither case did the wage-earners, at least the lower grades of wage-earners, have any claim to employment or any voice in the determination of the conditions of advancement, or any guarantee against dismissal for causes beyond their own control. It is to protect their interests under such conditions of employment, to transfer the scene of the wage-contract from the

door of the factory to the floor of the council-chamber, that wage-earners of sufficient intelligence and under favorable conditions have voluntarily submitted their individual will to their collective will, expressed through the labor organization or trade union.

It must not be supposed that the condition of the employees of the state had not been improved in the absence of association on their part. During the twenty years following the foundation of the empire (1871-1890) the money wages of the German postal employees had increased by rates, varying, according to the category of labor, from ten to ninety per cent.¹ Real wages had unquestionably increased also, although less rapidly than money wages. But workmen who have increases of wages thrust upon them, so to speak, cannot but feel that they would have secured greater increases if they had been in a position to bargain intelligently. One isolated applicant for employment in an industry employing a hundred thousand is in no position either to ascertain the true value of his services to the management or to insist upon the reasonableness of his demands, if by chance he is able to formulate them. After the reversal in 1890 of the policy of the government towards the association of members of the working-classes, the consciousness of the defenselessness of their position led the governmental employees to take advantage of their opportunity and to form associations, as their comrades in private employment were doing, with a view to the promotion of their economic interests.

The only association of postal officials for the promotion of their economic interests of more than local significance, that was formed in Germany before the expiration of the special legislation against the Social Democracy, was the Bavarian Union of Transportation Officials (*Bayrischer Verkehrsbeamtenverein*).² This association

¹ Jung I, p. 156.

² The following account of the origin of trade-unionism in the German postal and telegraph service is taken from Kulemann: *Die Gewerkschaftsbewegung*, 1st edit., pp. 316-331. So far as his relation is based on the debates in the Reichstag, it has been checked by the present writer with the original sources. For the rest Kulemann, at the time of writing the first edition of his *Gewerkschaftsbewegung*, was opposed to the principles of the Social Democracy, and free from bias against the imperial postal and telegraph authorities. There is no reason for supposing that he has misrepresented facts no longer capable of verification by the independent investigator.

was founded in 1883 and was open to the higher officials of the state railroad, postal, telegraph, and telephone systems. It was not open to the lower ranks of officials, the clerks or the laborers. In 1884 a sharp criticism of the attitude of the governmental Department of Transportation towards its employees was published in the organ of the association. In consequence of this mixture of the union in the internal affairs of the department, the government declared the union to be a political association, and consequently subject to the special legislation against the Social Democracy. This declaration on the part of the government made necessary, either the immediate dissolution of the union, or its reorganization with the exclusion of the elements that were objectionable to the Department of Transportation. The union chose the latter course. In 1885 it was recognized once more by the department as a lawful association, and the General Director of the Bavarian Transportation Services became an ordinary member of the association. The latter had purchased its life, however, by surrendering all claims to become anything more than a social club. As such it is still in existence.

No other attempt was made to organize the postal and telegraph employees until 1890. Then (June 6, 1890) one of the lower grades of postal and telegraph employees formed an association (*Verband deutscher Post- und Telegraphen-Assistenten*)¹ to represent their interests in the service. Its purposes were declared to be the assistance of widows and orphans of deceased members, and mutual coöperation in helping one another tide over misfortunes of all sorts, particularly in case of accident, illness, or death. In 1891 the association established a coöperative store, chiefly to provide the members with uniforms at cost, and to rescue them from the toils of clothing-on-credit dealers. The members of the union who joined the coöperative store were required to pay in 3 marks a month until they had 60 marks to their credit. All purchases were deducted from their credits, and interest was allowed on the balance at 4 per cent. This branch of the work of the association was greatly appreciated by its members, and together with

¹ Subordinate officials in the larger offices, and postmasters in offices of lesser importance.

its other activities formed a sufficient basis for a flourishing association.

Had this not been the case, the association would never have survived the early stress of open hostility on the part of Stephan, then chief of the imperial postal and telegraph service. Great as were Stephan's services to the state, his employer, in building up the business confided to his care, he had no comprehension of the forces underlying the labor movement which had accompanied the progress of the factory system of industry in his country, and doggedly adhered to the current notion among German employers that the employer must be absolute and unchallenged master in his own establishment. He did not need to wait for the organized postal and telegraph employees to show a disposition to interfere in the relations between their chief and the individual wage-earner. It was enough for him that they were dissatisfied with the conditions of employment which the government, in its paternal care for its servants, had provided for them, and were seeking to supplement the imperial workmen's insurance by private undertakings of their own. He did not hesitate to show his displeasure, proceeding at once to apply the principle of the old Greek tyrant by cutting off the heads, metaphorically speaking, of those who stood above the general crowd. In fact, it was partly to provide employment for one Funk, who had been particularly active in the formation of the association, becoming its first president, and who had in consequence been dismissed from the service, that the coöperative store was established. Funk was given the position of manager. Such harsh treatment of the employees raised a storm of criticism in the Reichstag. The result was that to the period of hostility towards the employees' association, on the part of the chief of the service, there succeeded a period of ungracious tolerance.

This lasted until 1898. By that time the membership of the association had increased to a round 14,000, that is to say, about 40 % of the total number of employees of that grade. In 1898 there was a general revision of wages in the imperial German and royal Prussian governmental services. But the postal and telegraph administration did not propose any increase for the class of

employees which composed the majority of the association. The latter appealed to the Reichstag, when the postal budget came up for consideration, and, despite the protest of the Secretary of State for the Postal and Telegraph Service, von Podbielsky (who succeeded Stephan at the latter's death in 1897), secured the sanction of an overwhelming majority for their request for higher pay.

This success on the part of the organized employees was enough to convince their chief that matters could not be allowed to go further, if he would maintain his mastery over the service. Accordingly, a year later he summoned several of the leaders of the employees' organization, and declared to them that their union constituted a state within a state, so to speak, which was inconsistent with the existing scheme of government. It attempted to represent the special interests of a class of employees, whereas it was not proper that the latter should feel themselves to be anything other than a part of the whole. He, their chief, not the union, would represent their interests, just as he did those of other classes of employees. He accordingly demanded that the union should strike from its constitution that part of the statement of its object which was inconsistent with an unqualified trust in him as their sole representative in matters concerning their terms of employment,¹ and that it should appoint a committee which would be

¹ The objects of the *Verband Deutscher Post- und Telegraphen-Assistenten* were declared at its organization in 1890 to be:—

i. To provide an association for postal clerks, telegraph operators, letter carriers, etc., which should rest on a "lawful foundation" (i. e., which should have no connection with the Social Democracy or the Social Democratic Trade Unions);

ii. To promote the economic interests of the class of employees for which it was established;

iii. To bring, however, no employee in conflict with his duty;

iv. To avoid controversies with their superiors (membership was to be made a recommendation, not a reproach to the employee);

v. To defend, however, the civil rights of members, even against encroachment by superiors;

vi. To promote the extension of the organization;

vii. To act openly in all matters;

viii. To encourage self-reliance among the members, and

ix. To avoid mixture in politics.

It was clause ix that was stricken out at the behest of the Secretary of State for the Postal and Telegraph Service. Up to that time the union seems to have adhered conscientiously to a fair interpretation of its objects. To what extent it departed

responsible for all statements published in their organ, the German Postal Gazette (*Die Deutsche Postzeitung*).¹ The union did as it was bidden.

At the same time the imperial postal authorities took the occasion to assert their mastery over another employees' organization, which had been recently called into existence. This was the Association of Under-officials of the Postal and Telegraph Service (*Verband der Deutschen Post- und Telegraphen-Unterbeamten*). The under-officials were inferior in the economic scale to the members of the V. D. P. T. A., and comprised the letter carriers, telegraph distributors, etc. Their organization was founded January 30, 1898, and was the outgrowth of a number of local associations of that class of postal and telegraph employees in the larger cities, which had been established for purely social purposes. Several of the more solid of these local associations maintained mutual life assurance funds. In Berlin, in 1895, there were two such mutual benevolent associations with, in round numbers, 10,000 and 9,000 members respectively. An attempt to organize one general mutual life assurance fund for all employees of that class throughout the empire was frustrated by the refusal of the administration to countenance the proposal. Then the chairman of the Letter Carriers' Mutual Benevolent Society in Berlin, who had been the author of the former scheme, devised a new scheme for an amalgamation of the existing local societies. It was this scheme which ripened into the *Verband der Deutschen Post- und Telegraphen-Unterbeamten*.

from clause v by acceding to the demands of the Secretary of State will be discussed in another place. In place of clause II was substituted the statement that the object of the association was the promotion of good fellowship among its members (*die Pflege der Kameradschaft*).

¹ The organ of the association was established in 1890 at the same time as the association itself. It had served as the mouthpiece of the association during its agitation in 1898 for higher pay. The editor was not at that time in the governmental service, and there was some talk on the part of the opponents of the organization of employees of the state of demanding his removal and the substitution of a man who would be directly under the control of the government. The Secretary of State decided, however, that it would be sufficient for his purpose if there were a number of employees designated by the association, whom he could hold responsible for the conduct of the editor of its organ.

The success of the scheme had been greatly promoted by the editors¹ of a periodical known as the *Deutsche Postbote*. This periodical was established in 1895, by one Remmers, who had formerly been a *Postassistent*, and active in the formation of the *Verband Deutscher Post- und Telegraphen-Assistenten* in 1890. He had lost his position in consequence, but secured employment on the staff of the *Postzeitung*. After a period of activity on that organ, he decided to found a special periodical for the under-officials, and speedily built up a circulation of 20,000 copies for his paper. This paper was not made the official organ of the *Verband der Deutschen Post- und Telegraphen-Unterbeamteten*, but was used as its mouthpiece for official notices. At the same time the paper undertook to champion the cause of higher pay for the under-officials, and committed the fault which the Secretary of State afterwards (February 4, 1899) described in the Reichstag as "demanding wages for the government's employees which it was absolutely impossible to pay." Such agitation raised a spirit of discontent in the postal and telegraph service which the administration could not tolerate and elected to repress by persecution rather than to conciliate by concession.

All under-officials who were known to be subscribers to the sheet were warned to discontinue their subscriptions, and those who advertised in its columns to renounce their support. A number of employees were dismissed for failure to heed these admonitions. The circulation of the sheet suffered a rapid decline. At the same time the authorities encouraged the publication of a rival sheet, which would not assume an independent position towards themselves (*Die Neue Post*). Finally (May 30, 1899) the Secretary of State issued an order, declaring that whereas mutual benevolent associations among the under-officials may under some circumstances be for the good of the service, yet "on account of the difference of the circumstances in the various postal districts, and in consideration of the size of the imperial postal area, the extension of such associations to more than one postal district must be regarded as a mistake." At the same time it was ordered that thereafter only members of the employecs' associations who were still in the government service might be elected to office in

the associations. By these two measures the power of the *Verband der Deutschen Post- und Telegraphen-Unterbeamteten* ever to become an inconvenient representative of the economic interests of the employees was effectively destroyed.

The subsequent history of the relations between the postal and telegraph employees and their chief shows that the latter has resolutely adhered to his determination to be master in his own establishment. Every year at the discussion of the postal and telegraph budget, instances are cited in which the Secretary of State for the postal and telegraph service has chastised those among his employees who have shown a disposition to challenge his arbitrary authority. There is no reason for supposing that the methods of the German postal administration for maintaining its authority are any more arbitrary, despite the power of the government with which its chief is armed, than those of any other large employer of labor, who refuses to recognize the right of his employees to substitute collective for individual action in the conclusion of agreements concerning the conditions of employment. In fact the methods of the former are probably less arbitrary, since the chief of a great public business undertaking, though independent of political pressure in Germany, is more subject to the power of public opinion than is the great private employer.

An example from recent debates in the Reichstag on the budget will illustrate the manner in which the postal and telegraph administration has executed its policy.¹ In 1907 a member of the *Verband der Deutschen Post- und Telegraphen-Assistenten*, who was also a member of the committee which was held responsible by the administration for the utterances of the official organ of the association, was fined by order of the Secretary of State because an article had been published which the latter considered defamatory to himself. The Secretary of State, Kraetke, declared in response to a criticism of his action that the punishment had been meted out, not because the article had attacked him personally, but because it affronted him in his capacity as chief of the service. He could not let go unpunished the publication of such an article

¹ *Die zweite Beratung des Etats der Reichs- Post- und Telegraphen-Verwaltung*. A. P. T., 1908, pp. 142 et seq.

in a periodical which was read by 34,000 of his employees without impairing the discipline of the service. This declaration was satisfactory to the majority of the supporters of the government. To the minority, however, it seemed questionable if an accusation against an employee for publishing defamatory matter, and his conviction and punishment without any trial except the Star Chamber process in the private office of the person bringing the accusation, could be a proceeding calculated to improve the spirit of discipline in a great public business undertaking.

At the same time Kraetke was criticized for his continued refusal to permit the under-officials to organize a general association.¹ His reply was (1) that the under-officials in the different postal districts have no common interests which justify a general association; (2) that they have not the intelligence nor experience to conduct properly the affairs of such an association; and (3) that they would consequently abuse their privilege, if they had it, without promoting their own interests in the least. This position was also satisfactory to the governmental majority. Again it seemed to a minority that a Secretary of State was hardly a proper person to decide whether or not any body of citizens possess sufficient intelligence to know when their interests require the formation of an association, or to conduct the affairs of such an association after it shall have been formed.

At that time another general revision of wages, which had been made necessary by the general rise in the cost of living during the preceding decade, was in course of preparation. The officials of the class described as *Postdirektoren* and *Oberpostsekretäre* petitioned the Secretary of State to grant them an audience at which they might discuss with their chief their claims to an increase.² The audience was granted; but, when it appeared in the course of the interview that these officials had already handed a copy of their claims to several members of the Reichstag without awaiting the issue of their conference with their chief, the latter terminated the audience at once. In the Reichstag he defended his

¹ *Die zweite Beratung des Etats der Reichs- Post- und Telegraphen- Verwaltung.* A. P. T., 1908, p. 147.

² *Ibid.*

course in the statement that, if he granted an audience to a group of his employees, he expected them to show sufficient confidence in his good will to await the issue of the audience, before appealing to the Reichstag. His contention that his employees ought to have confidence in him was justifiable, and the fact that they did not shows that something was wrong in his attitude towards them.

The conviction that there was something fundamentally wrong with his theory of preserving the mastery of his own establishment is strengthened by the further progress of the general revision of wages. It had been known for some time that the administration recognized the need for such a revision and was already busied with the matter, but the employees were becoming impatient. In 1907, the skilled workmen and laborers in the combined services formed a union (the *Verband Deutscher Post- und Telegraphen-Arbeiter und Handwerker*) in order to press their demands for an improvement of the conditions of employment. The laborers possessed even less security of employment than did the clerks and lower grades of officials, for they enjoyed no legal status at all. The various grades of officials and under-officials (including letter-carriers and telegraph-operators) obtain their positions through competitive examinations, held in accordance with published rules, and retain them during good behavior, by virtue of the law providing for the organization of the imperial postal and telegraph service. The laborers, however, at this time were employed and discharged according to the fluctuations in the demand for their services; they were paid wages by the day instead of by the month or year, and had no assurance of equality of treatment or of protection against arbitrary dismissal. The skilled workmen, especially, found their position inferior to that of electricians in private employment. Moreover they possessed the additional disadvantage that their employer enjoyed an absolute monopoly of the kind of work they were accustomed to doing, and they could not seek another employer without abandoning their particular trade altogether. Under these circumstances they formed a union and demanded the publication of uniform conditions of employment in order that they might at least know how they stood. This was done; although, as Secretary of State Kraetke was careful to ex-

plain in the Reichstag, not because the workmen demanded it.¹ The establishment of uniform conditions of employment for the laborers and skilled workmen had, he declared, been under consideration for a long time, and it was a mere coincidence that their actual publication occurred so shortly after the organization of the *Verband Deutscher Post- und Telegraphen-Arbeiter und Handwerker*.

Meanwhile the various grades of employees, especially the lower grades of officials and the under-officials, were still being kept in ignorance of the nature of the alterations in the conditions of their employment, which they would sooner or later be invited to accept. Soon they began to grow impatient. Such a general revision of wages for a body of four or five hundred thousand employees — the wages of the Prussian railway employees and the imperial postal and telegraph employees are customarily revised at the same time — unquestionably is an undertaking that cannot be carried out in a day. The principle on which the remuneration of the subordinate employees of the state in Germany is based is that each class of employees shall receive the rate of wages customary for similar grades of labor in the locality in which the employment is exercised.² To establish and graduate accurately the local rates of wages for the several grades of labor employed in the postal, telegraph, and railroad services, is obviously a task of great magnitude. The Under-Secretary of the Imperial Treasury stated in the Reichstag (February 14, 1908) that the preparations for the revision had been under way for a year, but the new schedules were not yet ready to be submitted to the Reichstag.³ He could not tell when they would be ready. Towards the end of the year they were at last made public. The increase proved to be less than the employees had been led to hope, and during the course of December, 1908, a number of mass meetings of employees was held to protest against the inadequacy of the readjustment of their conditions of employment to the altered cost of living.⁴

¹ *Die zweite Beratung des Etats der Reichs- Post- und Telegraphen-Verwaltung*. A. P. T., 1908, pp. 153, 158.

² *Ibid.*, p. 142.

³ *Ibid.*, p. 148.

⁴ *Soziale Praxis*, 1908, xiii, p. 334 (Dec. 24, 1908).

As is unavoidable on such occasions, passionate speeches were made. The pent-up feelings of the disappointed employees, which could find no other way of escape, sought a vent in inflammatory harangues.

Such a state of affairs is deplorable. Nay more, such a state of affairs cannot permanently endure. To be sure, it is no worse than exists continually in private industry; but the employees in private industry are free to strike. A strike on the part of the several hundred thousand employees of the imperial postal and telegraph service and the Prussian state railways, however, would be too serious a matter. It cannot be regarded as a normal mode of securing attention to the grievances of the employed. Some rearrangement of the relations of master and servant in business undertakings of such great public importance must be devised.

The result of the events of 1899 was to deprive the employees of the state of the right to a collective will concerning the conditions of their employment. The right of the working classes in private industry to organize for the promotion of their class interests was denied to the members of that class who entered the service of the state. The chief of the postal and telegraph service maintained the doctrine that he should be master in his own establishment, and that he should deal with his employees in matters concerning the conditions of employment only as individuals. In practice this doctrine amounted to depriving them of any voice whatever in fixing the terms of the labor contract under which they entered the service of the state. Except in so far as they could influence the Reichstag through some party which might be in sympathy with their reclamations, they were forced to accept conditions of employment imposed upon them by their masters. There was, to be sure, always the alternative of not accepting employment under the government at all. Indeed it is on this ground, namely, that no one is compelled to enter the service of the state, that defenders of the policy of the postal and telegraph administration justified its conduct. The argument is that in businesses of such great public importance, the general welfare demands the subordination of the interests of the employee to

those of the state, and that the adequate protection of the public interest is only possible where the will of the employer (that is, of his representative, the Secretary of State) is absolute and unchallenged.

The first part of this argument may be accepted. Production is carried on for the benefit of the consumer, not of the producer. The qualification must be added, however, that the postal and telegraph service possesses no peculiar attributes, regarded from the standpoint of the consumers, that warrants them in treating it differently from any other branch of production. The business of transporting intelligence from place to place by post or telegraph, at least in times of peace, is not so nearly indispensable as is, for example, the business of raising foodstuffs. A strike of postal or telegraph employees would be temporarily more inconvenient, but would not produce as much lasting damage as would result from an agricultural laborers' strike at a critical moment of the season. The conception that the postal and telegraph service in time of peace is one of exceptional importance is without foundation in fact, and probably arose from the circumstance that it happens to be one which easily lends itself to conduct by the government, and in most countries is conducted by the government. This circumstance alone, however, affords no justification of a different relation between employer and employee from what would be proper under similar conditions in private employment.

To return to the main argument, clearly the second statement does not follow from the first. The condition of production is that the producer shall be assured a fair share in the enjoyment of the collective output of consumable goods. Unless some means be devised for guaranteeing to each set of producers a satisfactory procedure for determining what is its fair share, production will not be carried on, and the community of consumers will suffer the consequences of its own incompetence. The history of the German postal and telegraph service shows that when production is organized on such a gigantic scale as is the case in that industry, the method of determining the remuneration of the rank and file of the industrial army by an individual contract between the captain of

industry and each private wage-earner in his establishment must break down. It cannot be maintained. He who is able to read the signs of the times cannot fail to see that the rank and file will not tolerate it indefinitely.

The German government is not among those who are unable to read the signs of the times. In this same year (1908) it introduced into the Reichstag a bill to provide for the organization of Chambers of Labor (*Arbeitskammern*). The purpose of the government was to force employers and employed in each important branch of industry to choose representatives, equal in number, who should meet together at regular intervals, to discuss all matters of mutual interest. Chambers of Labor were intended to represent all the labor and all the capital employed in each important industry, and not merely organized labor and organized capital. In short the government proposed to create an improved mechanism for assigning to each class of producers its fair share in the collective output of consumable goods. The essence of that mechanism was the requirement that the expression of the collective will on the part of employers and of wage-earners in matters of mutual concern should be compulsory. The hoped-for result clearly is the promotion of collective bargaining.

The government, however, did not propose to extend the benefits of its scheme to its own employees.¹ So far had its declared purpose of 1890 to become a model employer been forgotten since its renunciation in 1896, that it could now coolly propose to accept the opposite rôle. There was no excuse for this. The means of adapting the same principle to the public business undertakings that it now proposed to impose upon the private had been repeatedly brought to the attention of the public authorities. Thus it was proposed by a member of the commission on the budget in 1908 that the Secretary of State should permit the postal and telegraph employees to designate several of their number who should constitute a permanent intermediary between the general body of employees and their chief.² Questions which might arise concerning the conditions of employment of any class of employees should

¹ *Soziale Praxis*, 1908, xii, p. 553 (Feb. 1908).

² *Ibid.*, p. 573. Art. "Vereinsrecht, Beamtenausschüsse und Postverwaltung."

be brought to the attention of the Secretary by this representative board or *Ausschuss*. Such matters should be acted on promptly, and if decided in a sense unfavorable to the employees, the reasons for the decision should be given fully and frankly. Only after such a reply had been received by the employees should it be permissible for them to appeal to the Reichstag. It was urged that such a practice would conciliate where the present practice only irritated, and would prevent much controversy from ever arising at all.¹ The Secretary of State, however, took no heed of the suggestion, and the governmental majority did not press it.

The success of the efforts of the imperial postal and telegraph authorities to maintain their mastery in the undertakings confided to their care and to prevent the expression of a collective will on the part of their employees would not have been possible without the support of the Reichstag. It may contribute to the explanation of the relations that have been maintained between the chief of the postal and telegraph service and his subordinates to examine the other aspect of the development of class consciousness among the German working-classes — the political movement.

¹ A representative board of this nature was created in Wurtemberg in 1906. *Verwaltungsbericht der Württemberg'schen Verkehrsanstalten*, 1906, p. 78. The board created in Wurtemberg, however, was intended to represent only the laborers, in the narrower sense of the term. Somewhat similar boards were created in the imperial postal and telegraph service by the rules for the regulation of the conditions of employment of the laborers and skilled workmen, to which reference has already been made. These boards, which went into operation on the first of April, 1908, were erected, one in each workshop or locality where not less than fifty laborers or workmen were employed in connection with telegraph or telephone construction. These boards were to form the vehicle for conveying all complaints to the local superintendent, for making proposals concerning the welfare of the local employees subject to their jurisdiction, and to conciliate disputes among the workmen themselves. They were to consist of from five to ten members, at least twenty-five years of age and of at least three years' service, elected by all the workmen, at least twenty-one years of age and of at least one year's service. The members of these boards were to hold office for three years, and they were to be eligible for reelection. Meetings were to be called at need, but at least twice a year, and were to be held during working hours. There should be no deduction of wages for such interruptions of work. The chairman should be an officer delegated by the local superintendent. (*Soziale Praxis*, 1908, xii, p. 553.) These boards, however, were of local, not general, interest, and applied only to laborers and electrical workmen, not to the class of under-officials. The organization of these local workingmen's boards is, at most, an entering wedge. Their importance will depend on the spirit in which they are administered.

The Social Democracy avowedly aims at a transformation of German political as well as economic institutions. For this reason it has always been held by those in authority that open allegiance to the Social Democracy was irreconcilable with the service of the state in any position of honor or profit. Thus von Podbielski declared in the Reichstag in 1898, during the course of the debate on the postal budget, that he should consider any participation, direct or indirect, by an employee in his department in the agitation of the Social Democrats as a violation of their oath of fidelity to the state, and should dismiss at once any employee who should be guilty of any act of that sort.¹ More recently Prince Bülow, then Chancellor of the Empire, declared in the Prussian Landtag: "No official of the empire may avow adherence to the Social Democratic party."² In accordance with the law of self-preservation, the classes of society that control the Prussian and the imperial governments unquestionably have a right to enforce this rule, if they can, just as the Social Democrats have the right to rebel, if they dare. It cannot be justified on any other ground. For our present purpose we are interested chiefly in the manner of its enforcement.

The ballot in imperial elections is secret. Consequently it is not possible to prevent a government official from voting for Social Democratic candidates.³ But the employee of the state

¹ Cf. Kammerer: *La fonction publique en Allemagne*, p. 188.

² "Ein Beamter darf sich nicht der Sozialdemokratie bekennen." House of Delegates, January 19, 1909.

³ It is generally understood that in fact the workmen and lower grades of officials in the service of the imperial and Prussian governments generally do vote with the Social Democratic party. But none of the employees' associations lends any official countenance to the Social Democracy or maintains relations with the socialistic trade-unions. Even the employees' associations in the South German states, where the government is less stringent in its censorship of its dependents, are careful to avoid alliances of any sort with the socialistic trade-unions. Thus such associations as the *Deutsche Eisenbahnhandwerker* (35,091 members), the *Bayrisches Post-personal* (2,439 members), the *Badische Eisenbahner* (8,700 members), the *Württembergische Eisenbahner* (7,345 members), and the *Württembergisches Post-personal* (2,557 members) are reported in the fourth International Report of the Trade Union Movement, 1906 (Berlin, 1908), p. 101, as having no affiliations either with one another or with any other trade-unions, although professing a so-called "Christian" character. The *Bayrische Eisenbahner* (22,155 members), on the other hand, was openly affiliated with the main body of Christian (that is, Catholic) trade-unions.

can be prevented, not only from playing a leading part in the Social Democratic party, but also from lending aid or comfort in any indirect way to the "subverters of the state."

Two instances may be cited. In the city of Magdeburg in 1903, there was a coöperative store, conducted under the title of *Konsumverein Neustadt-Magdeburg*, the management of which was in the hands of Social Democrats. The local postal authorities forbade the postal and telegraph employees to become members of the society.¹ The second instance occurred in 1907. A physician in Wiesbaden, who held the appointment of official medical examiner in accordance with the workmen's insurance legislation, voted for a Social Democrat at the elections to the Reichstag. He indiscreetly told a friend in a public place what he had done. His words were overheard and eventually reached the ears of the Secretary of State. The latter at once notified the physician that unless he resigned his appointment he would be dismissed. He refused to resign and consequently was dismissed. In this case the offending physician was not himself a Social Democrat, but voted for the Social Democratic candidate as the lesser evil, from his point of view, of the two candidates standing for the election. When an explanation was demanded in the Reichstag the Secretary of State replied that he had dismissed the physician, not because he voted for a Social Democrat, but because he let it be known that he had done so. Dismissal was, in the Secretary's opinion, necessary in order that the postal and telegraph employees might have no cause for uncertainty as to the precise attitude which was expected of them by their chief towards the Social Democracy.²

The opposition on the part of the German imperial government to the organization of its employees for economic purposes is a corollary of its policy towards the Social Democracy. The government cannot, or will not, distinguish between its functions of policeman and of business man. Since as "policeman" it is commissioned by the ruling classes to put down any political movement

¹ *Stenographischer Bericht der Verhandlungen der Reichstages*, May 11, 1904. Speech of Abgeordneter von Gerlach.

² *Ibid.*, Feb. 15, 1908. Declaration of Secretary of State Kraetke.

that threatens the foundations of their power, likewise as business man it frowns upon any economic movement that savors of the same tendency. So long as the powers that be remain unalterably opposed to the democratization of politics, they cannot be expected to consent to abandon their autocratic power over the industrial undertakings of the state. The recognition of the right of governmental employees to substitute collective for individual bargaining with the captains of governmental industry would be an indirect concession to the principles of the Social Democracy. Whatever may be the attitude of the government towards collective bargaining in private industry, it cannot consistently encourage the growth of a collective consciousness among the members of the working-classes in the employ of the state.

At present the German citizen who accepts employment in the imperial postal service, except as an unskilled laborer, enjoys tolerable certainty that, during good behavior, as the term is understood by his chief, he will be able to earn a livelihood, and to retire, with a modest allowance for his old age, when his working days are over. But in order to obtain this security for the future, he must surrender not only his right to associate with his fellows for the purpose of mutual assistance in promoting their common interests as wage-earners, but also his liberty to exercise the fundamental privileges of citizenship, the liberty of expressing his views on political questions, and of playing a part in the politics of his country.

The price of this sacrifice, the right to work, as it were, is very attractive to the man who must sell his labor from day to day in order to live. Under the factory system of production, the wage-earner in private employment feels a certain helplessness when he reflects that his bread and butter depend on circumstances which are beyond his control, that is, on the prudence and good fortune of his employer. It is to escape from this feeling of dependency that he strives through organization to acquire a voice in the management of his employer's affairs, for this is what trade-unionism means from the standpoint of the employer, of the man who wishes to be master of his own establishment. It is because public ownership offers the wage-earner at least the possibility of acquiring a

greater voice in the determination of his own destiny than he can ever hope to acquire in privately owned industry, that wage-earners as a class strive to extend the scope of the business enterprise of the state. That the powers now in control of the German imperial government can permanently deprive the citizens in its employ of any portion of their ordinary rights of citizenship is in the light of history incredible.¹

Hitherto, as a possible agent in the redistribution of wealth, public ownership of business undertakings, such as the telephone, has received little consideration by the German imperial authorities. The effect of public ownership has been to remove from the realm of private business enterprise a possible source of business profits; but from the point of view of the public authorities it has simply altered the mode in which the public revenue from the telephone business has been collected. Instead of exacting a share of the profits of a private business, the government has taken the business into its own hands and enjoys all the profits. From the point of view of those who gain a livelihood by employment in the telephone business, public ownership has brought a change of masters, but as yet no important change in the relations between master and servant.

¹ The strength of the opposition on the part of the German government in the past to everything that savored of interference with their method of dominating their employes will some time appear equally incredible. Only ten years ago, a thorough examination of the conditions of employment and wages of the officials and laborers in the service of the several German state railroads was planned by the *Verein für Sozialpolitik*, but had to be abandoned, because the support of the Prussian railroad authorities was refused. Nor were any reasons given for their refusal. The Bavarian, Saxon, and Badenese authorities followed the example of the Prussian, partly with and partly without explanation. Cf. Baron von Berlepsch: Introduction to vol. xcix of the *Schriften des Vereins für Sozialpolitik*. The study in this volume by W. Zimmermann: *Zur sozialen Lage der Eisenbahner in Preussen* (1902), is nevertheless the most valuable contribution we possess to the literature dealing with the economic condition of the employees of the state in Prussia. For a detailed account of recent developments in the labor situation in the German and Prussian services, cf. Emil Lederer, "Die Bewegung der öffentlichen Beamten," *Archiv für Sozialwissenschaft und Sozialpolitik*, 1910, pp. 660-709.

PART II

PUBLIC OWNERSHIP OF TELEPHONES IN SWITZERLAND

CHAPTER XII

THE DEVELOPMENT OF THE SWISS GOVERNMENTAL TELEPHONE SYSTEM

IN Switzerland the attitude of the government towards the telephone was at first undecided. The law of October 23, 1851, had established the telegraph as a part of the governmental postal monopoly, and the postal authorities¹ consequently felt under obligations to take cognizance of any improvements that might be made in the means of telegraphic communication. As soon as the telephone was brought to the notice of the Federal Council, an ordinance was issued, February 18, 1878, declaring that the new invention fell within the scope of the public telegraph monopoly, and steps were at once taken with a view to facilitating its introduction into Switzerland. At that time there was no public exchange system in operation anywhere in the world, and the telegraph authorities anticipated no other use for the telephone than its employment as a substitute for speaking tubes, or signal systems of various sorts, in private establishments. With the purpose of removing as far as possible the restrictions on the creation of such private telephone facilities which resulted from the fact of the governmental telegraph monopoly, the same ordinance that brought the telephone within the telegraph monopoly provided for the granting of special licenses to persons who should desire to use the telephone for private purposes.²

The opinion of the Bundesrat concerning the nature of Bell's invention was not permitted to go unchallenged. On May 30, 1878, a resident of Zurich complained that the ordinance of the Bundesrat constituted an infringement of the Swiss citizen's

¹ The postal and telegraph monopoly is administered by the Bundesrat or Federal Council, and together with the railways constitutes one of the seven departments into which the work of the council is divided.

² P. Reinhard: *Die Entwicklung des Telephonwesens der Schweiz und die volkswirtschaftliche Bedeutung der schweizerischen Telephongesetzgebung*, Berne, 1898, p. 17.

liberty to engage in any lawful profession or trade. The matter was carried into the Federal Assembly at its next session, where, after a thorough debate (December, 1878), the representatives of the people sustained the interpretation of the Bundesrat of the extent of the public telegraph monopoly, and declared that the telegraph authorities at their discretion might reserve the exploitation of the new invention to the government, or grant limited concessions to private persons, provided they took proper precautions to ensure the legal maintenance of the public telegraph monopoly.

Still the telegraph authorities could not definitely make up their minds as to the proper course for them to pursue. The course of events in America soon indicated that the telephone was capable of rendering a more general service than had been at first supposed; that it was, in short, an invention with a great future before it. However, the American experience was not a sufficient guide for the Swiss telegraph administration, because in America the telegraphs were not owned by the government. In Europe, where the telegraphs were everywhere in the hands of the public authorities, none but the Germans had introduced the telephone into the telegraph undertaking. So long as there was no demand in Switzerland for the establishment of telephone exchanges, the government's indecision had no serious consequence. But by 1880 private enterprise had become convinced that the local exchange business would prove a paying venture. A group of Zurich business men became importunate, and on July 24, 1880, a concession was granted for the establishment of an exchange in that city.¹

This concession bestowed the right to conduct exchange operations in Zurich for twenty years. It prohibited the concessionnaires from charging more than should be charged on telephone exchange systems that should thereafter be established by the government itself, provided for the division of net profits in excess of 8 % between the concessionnaires and the telephone subscribers, and stipulated that the government should have the option of purchasing the plant at a fair valuation at the end of the concession. The further regulation of the undertaking was intrusted to the city of Zurich. Shortly afterwards an application by the original

¹ *Geschäftsbericht der Telegraphenverwaltung pro 1880*. Bundesblatt, 1881, ii, 373.

concessionnaires for permission to transfer their rights to a stock company gave the government an opportunity to secure important alterations in the terms of the concession. The most significant of these was the reduction of its duration to a period of five years.

In fact, the confidence in the future of telephony displayed by the Zurich promoters had determined the telegraph authorities in regard to their own course of action. They at once resolved to grant no more concessions, but to establish on their own responsibility all other urban exchange systems that should be demanded. They set to work at once to carry out their new resolution. Governmental exchanges were opened to the public in Basel and Berne during the course of 1881, and in the following year in Geneva, Lausanne and Winterthur. Thereafter the construction of exchange systems by governmental enterprise went forward rapidly. There were fourteen in operation at the end of 1883, and twice as many a year later.¹

Another cause contributed to the resolution of the administration to develop the telephone business as a direct state undertaking. This was the recognition that the telephone was destined to become an important factor in the further extension of the telegraph system to the rural population. This was a work which the Swiss telegraph administration had always had near to its heart. Indeed, the creation of facilities for more rapid diffusion of intelligence among the isolated rural communities had been a leading purpose in the original establishment of the state telegraphs. By 1880 the economy of the use of the telephone as an auxiliary to the telegraph in rural districts had been clearly demonstrated. Hence the Federal Council resolved to modify the conditions for the establishment of rural telegraph offices with a view to encouraging the use of the telephone as a substitute for the telegraph. It was provided that places which were not yet supplied with a telegraph office might be connected with the nearest telegraph office and so with the general telegraph system of the country by telephone. Villages which should desire such a connection were required to contribute a sum towards the expenses of construction equal to about one half of the total cost, but in no case less than 100

¹ Geschäftsbericht, *passim*.

francs, and to provide quarters and attendance for the office. The village authorities were allowed to recover their advances by charging a surtax of not more than 25 centimes on all messages originating at the village office. Thus the financial burdens imposed on the local authorities by this revised ordinance were very much lighter than those contained in the original ordinance of 1857.¹ This policy of local initiative and local contributions towards the cost of construction had helped to make the Swiss telegraph system the most extensive and the most largely patronized in the world. Its application to the telephone business by the telegraph administration in 1880 was confidently expected to enable the Swiss service to maintain its superiority.

Once the beginning had been made, the further development of telephone service was rapid. The establishment of public call-offices in connection with local exchange systems was provided for by an ordinance of the following year.² The first inter-urban long-distance line was erected early in 1882 to connect the newly established exchange system in Winterthur with that in Zurich. With the rapid construction of additional exchanges, which was begun in that year, went a corresponding extension of the inter-urban toll system. At the end of 1885 there were 39 inter-urban toll lines in operation, as compared with 23 in Germany at the same period.³ By the expiration of the franchise of the Zurich telephone system at the end of 1885 there was no longer any doubt in Switzerland concerning the future status of the telephone industry. Both the government and the people were agreed that it should be a governmental undertaking. The advantage of the re-purchase of the private system at Zurich was universally recognized, and the necessary appropriation was made by the Federal Assembly without opposition.⁴ Since January 1, 1886, the government has owned and operated all the telephones in Switzerland.

¹ *Verordnung über die Einrichtung öffentlicher Telephonstationen vom 29. Nov. 1880.* Bundesblatt, 1880, iv, 487. The previous regulations were established by ordinance of Aug. 6, 1857. Cf. Introductory chapter, pp. 13, 14.

² *Verordnung vom 11. Okt., 1881, über die Einrichtung öffentlicher Sprechstationen in Städten mit staatlichem Telephonnetz.*

³ A. P. T., 1887, p. 676.

⁴ *Botschaft des Bundesrates an die Bundesversammlung betreffend den Rückkauf*

At that time the Swiss telephone system was the most extended — measured on the basis of population — in Europe. Compared with the telephone system of its great northern neighbor, Germany, the Swiss system was not only more widely used in the commercial centers, but exchanges had been established in much smaller places than was the case at that time in Germany. The service was also cheaper. The Swiss flat rate had been fixed at 150 francs, or scarcely four fifths of the German rate, and the Swiss inter-urban rate, 20 centimes, was much cheaper than the German. But it should be added that the inter-urban messages, for the most part, traveled shorter distances than in Germany.

Compared with the private system which had been maintained in Zurich,¹ the government system was operated at about the same level of rates, but adjusted on a more reasonable basis. The Zurich Telephone Company had offered their subscribers no other choice than flat rates for an unlimited service, as the government did also, but the company fixed its annual charges at 100, 150, 200, and 250 francs per telephone, according to a schedule the basis of which appears to have been purely arbitrary. The average rate was a trifle over 140 francs, or a little less than the government rate, but in the absence of a definite basis of charge, the customers of the company must have incurred the risk of personal discriminations, a nuisance which government ownership effectually terminates. The company established public call-offices for non-subscribers, but charged twice as much per call as did the government for the use of its public pay stations.

Up to this time, however, the Swiss telegraph administration had carried on the telephone business with the consent of the legislative branch of the government, but without its advice. The consent of the Federal Assembly had been indispensable to the successful assumption of competence in telephone affairs by the Federal Council, and later to the acquisition of the private exchange system at Zurich. That consent had been freely given, but in so democratic a government as the Swiss the executive could not

des Zürcher Telephonnetzes. Bundesblatt, 1884, iv, 274. Cf. Reinhard, ch. 1: "Die Geschichte des Telephonnetzes unter der provisorischen Organisation."

¹ HGK München, 1881, pp. 50-53.

long administer a business of such growing importance as the telephone business without the advice, as well as the consent, of the representatives of the people. In several respects the methods adopted by the telegraph administration for the development of the telephone service gave rise to criticism on the part of the public it had undertaken to serve. Such criticism is inevitable in any experimental and growing business. The only peculiar features in the early Swiss telephone situation were the ease with which the public could obtain a hearing for its criticisms and the promptness with which remedies were agreed upon and applied.

Public criticism was directed in the first place against a number of the telegraph authorities' administrative practices. The requirement that the prospective subscriber should bind himself for a long period, as in Germany also at that time, was criticized on the ground that it repelled many members of the public who could be easily convinced of their need for telephone service by a short trial at less risk. The conditions for the establishment of public call-offices in rural villages for the purpose of telephone connection with the nearest urban exchange were also regarded as onerous. The local authorities in such villages had hitherto been required to provide accommodation and attendance for the station, to pay the ordinary flat rate of 150 francs a year, and also the mileage charges of 3 francs per 100 meters in excess of 2 kilometers from the exchange. In other words, the local village authorities received no better terms than a private individual in the same village would have received.

There was less criticism of the administration's practice with regard to the establishment of public call-offices within existing exchange areas or of new exchanges in fresh areas. The telephone authorities made special arrangements with subscribers who wished to open their connections to the public and in the larger cities constructed public call-offices freely. New exchanges were constructed whenever demanded by at least ten persons in any town or village not within the bounds of an existing exchange area, and except for occasional differences of opinion as to the extent of an existing area, the administration's policy in this respect gave rise to little criticism. Subscribers who were so situated as to be

unable to fulfill the requirements for a public exchange could always secure a private branch exchange by purchasing the requisite apparatus, providing accommodation and attendance, and paying the regular annual rates. In the event of such an exchange attracting fresh subscribers it could easily be transformed into a public exchange.

The administration's policy with respect to inter-urban lines was found less satisfactory. Originally, before the construction of inter-urban lines as a part of the public telephone system, the administration had permitted the construction of private trunk lines on the following conditions: ¹ two different localities might be connected by a private telephone line: (1) provided one of the localities was more than one kilometer distant from the nearest telegraph office; (2) provided the owner defrayed all the expenses; (3) provided the line did not prejudice the present or future development of the government telegraph system; and (4) provided that the owner paid an annual fee to the telegraph administration of 10 francs per kilometer, but not less than 20 francs in all. Public, i. e., cantonal and municipal, authorities were, however, excused from the payment of the fee. The concession might be withdrawn at the discretion of the telegraph authorities.

These conditions were certainly not calculated to encourage the construction of a system of inter-urban telephone lines of general benefit to the community; but it must be remembered that in 1878 an inter-urban telephone system was still a dream for bold inventors, — it was not yet a business proposition for practical persons. The use of the telephone for purely private purposes within the limits of a single private property was still uppermost in the minds of the manufacturers of telephones. When in the early eighties the government entered upon the construction of urban exchange systems, the advance of telephonic technique had made long-distance telephony a practicable commercial venture, and the government did not neglect to alter its policy. For several years it constructed interurban lines energetically, then discovered their injurious effect on parallel telegraphic lines and proceeded more cautiously.

¹ *Bundesbeschluss betreffend Konzessionen für Telephonleitungen* (vom 18. Feb., 1878). Bundesblatt, 1878, ii., 291.

At the same time the increasing average length of inter-urban connections first diminished the margin of profit on inter-urban business, then converted the profit into a loss. These circumstances, added to the need for a means of preventing ill-considered applications for long-distance lines on the part of over-sanguine business men, led the administration to adopt the German plan of requiring guarantees from the prospective beneficiaries of inter-urban lines as a condition of fresh construction. These guarantees were based on the cost of construction, and were intended to insure to the government a sufficient revenue to protect it against loss through the operation of the lines. It does not seem to have attempted to recoup its losses on the parallel telegraph lines, but the natural effect of this policy was to retard somewhat the transfer of inter-urban business from the telegraph to the telephone.

It is not easy to gauge the extent to which this policy impeded the development of the inter-urban telephone system. In 1887, when the business men of Basel desired a second wire to Zurich,¹ the telegraph authorities demanded a guaranteed annual income of 7,000 francs from the new line from the cantonal authorities. This guarantee amounted to 70 francs per kilometer. The cantonal authorities turned to the local Chamber of Commerce to assume the burden of the guarantee. This the Chamber readily agreed to do, since the quantity of fresh traffic in sight would yield more than the required income. The line was at once constructed. In this case the guarantee was superfluous and the Basel Chamber of Commerce was needlessly required to assume the risk of failure. In other cases, doubtless, the raising of the guarantee was more inconvenient, and in some it must have been altogether impossible, unless the policy were to fail in its purpose. Certainly this would be vexatious to business men, but not unreasonable, provided the amount of the required guarantees was not excessive.

The chief criticism of the policy of the Swiss telephone administration at this time, however, concerned the rates. This was to be expected, but the particular form which the criticism of telephone rates assumed in Switzerland was unusual. Unlike the agitation

¹ *Verwaltungs-Bericht des Kantons Basel-Stadt*, 1888, viii, 2.

at this time in Germany for a reduction of the local rates, that in Switzerland did not originate solely with the commercial classes, nor spring so much from the universal desire to cut down the expenses of transacting business, as from a peculiar Swiss desire to "promote the exchange of ideas by the popularization of the 'phone."¹ The large urban commercial interests, to be sure, asserted that the toll rate (which was raised in 1887 for distances above 100 kilometers from 20 to 50 centimes) was excessive; but the bulk of the criticism was directed against the flat rate for exchange service. The popular critics contended that under the system of flat rates the small users, and they were in general the non-commercial users, especially the denizens of the country villages and the farmers and peasant proprietors, paid a disproportionate share of the cost of supporting the telephone system. This was an injustice which could not be remedied by local rate discrimination as demanded by the early German rate reformers, but only by personal discrimination. Thus a different keynote was struck at the very beginning of the Swiss agitation for a reform of telephone rates. In the December session of the Federal Assembly, 1887, the Federal Council was invited to draft a bill for the purpose of regulating the conduct of the telephone business, and of reducing the rates.

The Federal Council reported its bill at the December session of the following year.² In the message which accompanied the bill, the Council explained the delay in the framing of legislation to regulate the conduct of the telephone business by the uncertainty which had hitherto surrounded the infant industry.³ Neither the technical nor the commercial conditions under which telephone service had been rendered were sufficiently stable to afford a basis for the calculation of a new and logical schedule of rates. The message conceded that the more rapid popularization of the telephone required a revision of the terms of the subscribers' contract as well as of the basis of the rates, and proceeded to lay down

¹ *Kommissionalbericht des Ständerates über die Geschäftsführung des Bundesrates für 1889*. Bundesblatt, 1890, ii, 765.

² *Botschaft des Bundesrates an die Bundesversammlung über den Gesetzentwurf betreffend das Telephonwesen vom 13. Nov., 1888*. Bundesblatt, 1888, iv, 649.

³ *Ibid.*, 650.

general principles upon which such a revision should take place.¹

The uniform flat rate, the message declared, was unsound in principle, because it attempted to cover at the same time the expenses of construction and those of operation. The result was that subscribers of long standing paid a disproportionate contribution towards the expenses of construction, whereas new subscribers who wished to withdraw could not do so without throwing the expense of their connection back upon the administration. Hence arose the necessity for a long contract period. Furthermore, the flat rate compelled small users to defray a portion of the expense of rendering service to the large users. At that time the number of annual talks from a single subscriber's station ranged all the way from 200 to 30,000. This inequality in the use of the telephone under the existing flat rate occasioned a corresponding inequality in the charge per message. Whereas the smallest user paid 75 centimes per talk, the largest paid only $\frac{1}{2}$ centime. This inequality in the burden of the rates was the more unfortunate since the heaviest charge fell on the shoulders of those least able to bear it.

The remedy was to separate the charge into two portions, one fixed in advance and intended to cover the costs of construction, the other variable and depending on the use of the service. The former should be so adjusted as to reimburse the telephone administration, within a few years of the beginning of the contract, for the cost of the subscriber's share of the exchange equipment. Thus the necessity for a long contract period would be obviated. The variable charge should be a definite fee for each talk. On account of the inconvenience of making an accurate enumeration of all calls, the Federal Council proposed to depart from the logic of a pure message rate, and to charge 5 francs per hundred or fraction thereof in excess of five hundred and to include the first five hundred talks under the fixed portion of the annual dues without further charge. The fixed charge was set at 120 francs the first year, 100 the second, and 80 the third and each succeeding year. As the average number of talks per telephone in 1887 was between

¹ *Botschaft des Bundesrates an die Bundesversammlung über den Gesetzesentwurf betreffend das Telephonwesen vom 13. Nov., 1888. Bundesblatt, 1888, iv, 653.*

1,200 and 1,300, this scheme fixed the limit of unpaid talks sufficiently low to insure a considerable differentiation in the total charge to large and small users. On the basis of the existing use of the service, a bare one third of the subscribers would have fallen below the limit of five hundred free talks a year.

The telephone administration estimated, however, that the adoption of the proposed schedule of rates would diminish by thirty per cent the average annual number of calls per subscriber's station, which would have increased somewhat the proportion of subscribers who would escape the payment of the variable part of the proposed rate. Yet the reduction of the flat rate was so great that, on the basis of their existing use of the service, only seven per cent of the total number of subscribers would have to pay more under the proposed than under the existing schedule of rates.¹

Such a radical reduction of rates was only possible because experience had shown the former flat rate of 150 francs to be excessive. During the eight years the government had been engaged in the telephone business, it had not only met all operating expenses out of current receipts, but had also found in a similar manner all the sums needed for fresh construction. Thus no funds had been required for interest and amortization, and the realized surplus had not only sufficed for the replacement of worn-out and obsolete plant, but had still furnished a small net profit to be covered into the Federal Treasury. The proposed rates were estimated to yield an average of 90 francs per station from the existing subscribers, an average that would tend to be increased by the constant accession of new subscribers. At this level of rates, the Federal Council estimated that it could meet all operating expenses, as well as the fixed charges on the capital to be required for new construction; for it proposed, now that the experience of eight years furnished data for the calculation of rates of depreciation and of the demand for new facilities, to relieve the old subscribers from the burden of financing new construction and to raise fresh capital, as needed, by advances from the Federal Treasury.

The same principles were applied to the reform of the long-dis-

¹ *Bericht betreffend den Gesetzesentwurf über das Telephonwesen der Kommission des Ständerates (vom 6. April, 1889). Bundesblatt, 1889, ii, 284 et seq., esp. 311, 312.*

tance rates. That branch of the service had not been yielding any profit, and the revision of rates consequently had to be upward instead of downward. On the basis of the average cost of construction of toll lines, of the operating expenses and fixed charges as well as of up-keep and their use by the public, the Federal Council computed that an average yield of 75 centimes per message was necessary to make both ends meet in this branch of the service. Instead, however, of drafting a schedule of zone rates which would have yielded such an average, the Council declared that not the distance a toll message traveled, but the time the plant was occupied in transmitting the message, was a more convenient and, under the circumstances, a more nearly just basis of toll rates. Consequently, it proposed to establish a universal flat toll rate of 75 centimes for all inter-urban lines in Switzerland and to reduce the period of a single talk from five to three minutes. Longer talks would be counted as many times as they contained periods of three minutes, fractions of three minutes being counted as one talk. This proposal contemplated an increase of the charges on all toll talks, and for connections between neighboring towns the increase would have been very considerable.

The Federal Council's bill was received, in the quarters for the benefit of which it had been primarily framed, with every token of the liveliest satisfaction. The effect for all small users, wherever situated, would be a reduction of forty per cent in the size of their telephone bill, a reduction which more than surpassed their rosier anticipations. But among the commercial interests in the large towns, the proposals met with a less cordial greeting. The system of measured service rates was new to Europe, and the big business men had undoubtedly expected a general reduction of the flat rate instead of the introduction of a new basis of charge which would have the effect, for some of them at least, of increasing the cost of local exchange service. The increase of the toll rates, being more general, evoked a correspondingly more general protest, but one scarcely more intense.

The large users could not complain of the general level of the proposed schedule of rates, and directed their criticism against the location of the limit of free calls in the schedule of exchange

rates and against the system of classification adopted for toll rates. In the latter criticism they were joined by the public generally.¹ An alternative revised schedule of rates, suggested by the central organization of chambers of commerce and industry, will serve to illustrate the nature of all the critics' proposals:—

- (1) the limit of the free local calls should be raised to 1000;
- (2) the duration of a talk should remain at five minutes; and
- (3) the schedule of toll rates should be remodeled as follows:—

up to 50 kilometers	20 centimes
51-100 “	50 “
over 100 “	75 “

(i. e., roughly, 4 cents for a talk of not more than 30 miles,
 10 “ “ “ “ “ 31 to 60 miles, and
 15 “ “ all others).

The only argument in favor of raising the free limit of local talks was the familiar one that the burden on business interests must be made as light as possible. Under the circumstances this could not fail to be effective, since the business interests were well organized and agreed as to what they wanted, whereas the resistance of the other interests was weakened by the very magnitude of the concessions held out to them by the government's proposals. The argument against the abolition of the distance factor as one of the bases of classification for toll messages was more logical and found a ready response on all sides.

The result of the deliberations of the Federal Assembly was a compromise.² The duration of a message was left at three minutes, as proposed by the Federal Council; but the rate for toll messages transmitted not more than 50 kilometers was fixed at 30 centimes, those transmitted from 51 to 100 kilometers at 50 centimes, and only on those transmitted more than 100 kilometers was the pro-

¹ Cf. *Bericht betreffend den Gesetzentwurf über das Telephonwesen, vorgelegt im Namen der Kommission des Ständerates (vom 6. April, 1889)*. Bundesblatt, 1889, ii, 284. This report contains (pp. 293-302) reprints of ten memorials addressed to the Federal Assembly or Council by the representatives of the various interests to be affected by the proposed legislation concerning telephone rates. The most important memorial came from the Swiss Commercial and Industrial Association, the general organization of the various cantonal chambers of commerce and industry.

² Law of June 27, 1889.

posed rate of 75 centimes retained. The limit of unpaid local talks was fixed at eight hundred per annum. The other proposals of the Council were accepted without important alterations. It was provided that subscribers might terminate their contracts on one month's notice, provided they paid an indemnity to the telephone administration of 40 francs, if the contract was of less than one year's standing, or 20 francs if of more than one but less than two years' standing. Local authorities were authorized to pay only 120 francs a year for public call-offices in villages without a local exchange, plus mileage charges on the connecting line for the excess over 2 kilometers from the nearest exchange. The call-office rate was left at 10 centimes, one half the receipts going to the local authorities who were to be held responsible for the maintenance of the station.¹ The telephone authorities were directed to establish exchanges and toll lines where a sufficient demand should be shown to exist, but were authorized to use their discretion in the establishment of reasonable *indicia* of the existence of a sufficient demand.

The Federal Assembly obviously intended that the telephone system should be conducted on the most liberal policy possible, but was not blind to the dangers of tying the hands of the administration too tightly in its dealings with the public. The financial effect of the ultimate schedule of rates showed less consideration for the contentions of the telephone authorities. It appeared ² during the course of the discussion of the government's bill that the official estimates of the yield of the proposed rates were sufficiently conservative to admit of some reduction in their general level; but the reduction actually adopted by the Federal Assembly, especially in the schedule of toll rates, was really considerable. Time would tell whether or not the representatives of the people had been too bold when they resolved to take a hand in the management of their telephone business.

Events showed that the confidence of the Federal Assembly in the discretion of its telephone administration was well placed. The former liberal policy of establishing new exchanges was main-

¹ All the receipts for the first 800 talks went to the local authority.

² *Bericht der Kommission des Ständerates*, p. 311.

tained, and the obligations imposed upon local authorities desiring fresh long-distance connections were reduced. The applicant (local authority, cantonal or municipal) for a new line was required to guarantee that the annual receipts should amount to 50 francs per kilometer, — a requirement which would seem to indicate that the former requirement had been excessive, or rather had proved in the light of later technical and commercial developments to have been excessive. The new guarantee was so fixed as to yield the administration an annual revenue of 15% of the cost of construction of inter-urban lines,¹ a rate of return, which, in the light of the facts then known concerning the life of telephone material and apparatus, can certainly not be regarded as excessive.

This policy of requiring a guaranteed minimum income as the condition of the construction of inter-urban lines not only served to prevent the construction of toll lines between neighboring towns that would not pay (and hence at the existing rock-bottom level of rates could not be fairly said to have been needed), but also, as the range of effective communication increased, served as a mode of automatically readjusting toll rates to the constantly altering conditions of service. A single illustration will show how this was accomplished.²

In the year 1892, the Merchants' Association in Lugano, in the Italian Canton of Ticino, asked for a long-distance line over the Alps to connect the three exchanges in that canton with the rest of Switzerland. Lucerne, the nearest Swiss town of importance, was 170 kilometers distant, and the desired line would be so expensive as to be unremunerative at the existing level of rates. At 75 centimes a talk, not talks enough could be transmitted in a year, with the line working at its fullest capacity, to earn fifteen per cent of the cost of construction. And as there were then only

¹ The guarantees ran for ten years, at the end of which time, if the receipts from traffic did not equal the amount of the guarantee and the local authority declined to renew it, the telephone authorities might dismantle the line.

² (1) *Botschaft des Bundesrates an die Bundesversammlung betr. einer Telephonverbindung zwischen den Hauptorten des Kantons Tessin und der Innerschweiz* (vom 24. Januar, 1893). Bundesblatt, 1893, i, 205.

(2) *Verwaltungsbericht Baselstadt*, 1895, viii, 4.

(3) *Geschäftsbericht des Bundesrates für das Jahr 1897*. Bundesblatt, 1898, ii, 599.

(4) *Geschäftsbericht des Bundesrates für das Jahr 1900*. Bundesblatt, 1901, ii, 764.

87 telephone subscribers in the entire Canton of Ticino, and as the inter-urban line connecting the three existing exchanges was not earning the amount of its guarantee, the Lugano Merchants' Association was advised to await the construction of a through-line between Switzerland and the great Italian commercial center of Milan.

The next we hear of the attempt to secure a toll line to Ticino is in 1895. Then the municipality of Lugano requested the support of the government of the canton of Baselstadt in behalf of the project for a long-distance line from Basel to Milan, via Lugano. The government of Basel turned, as was its wont, to the local Chamber of Commerce, to inquire if the latter would accept a portion of the guarantee for the projected line. The latter replied that it would not, because there was no sufficient demand for a line to Ticino and Milan. Business men in Basel preferred the telegraph for such a distance. But the business men of Ticino would not be discouraged. After another five years of more or less constant negotiation with the commercial interests north of the Alps, they undertook to give on their own sole responsibility the required guarantee. In 1900 a line was opened between Lugano and Zurich, and a second between Bellinzona and Lucerne.

During the first year after their opening, the traffic over these two lines averaged only thirteen messages a day. Consequently, the receipts amounted only to a bare third of the guaranteed income, and the real cost of the connection to the interests which had demanded it was nearly thrice the nominal rate. Yet the guarantee did not suffice to cover the costs to the administration, for the construction over the Alps proved to be exceptionally expensive. When in 1900, during the debate over the telephone budget in the lower branch of the Federal Assembly, it was proposed to relieve the local authorities of their guarantees for inter-cantonal lines ¹ (a proposal which, if accepted, would have thrown on the telephone administration all the loss occasioned by such lines as those from Zurich and Lucerne to Ticino), the Federal Council easily convinced the representatives of the people both of the theoretical soundness of the principle of guarantees and of

¹ *Geschäftsbericht des Bundesrates für das Jahr 1900*. Bundesblatt, 1901, ii, 768.

its practical justice in the particular case which had given rise to the proposal.

The popular satisfaction with the results of the revision of local exchange rates by the law of 1889 was less enduring than that with the results of the other features of that reform.¹ The new rates went into effect on January 1, 1890. The statistics of operation for the business year 1891 showed that in only 36 out of 91 exchange systems were there any subscribers sending more than 800 local messages a year. In nine exchanges no subscriber originated more than 100 local talks, in eleven others none more than 200, and in sixteen others none more than 400. The average use of a connection for the entire Swiss system was reduced to 545 originating talks. Obviously small users were still contributing toward the expense of rendering the service to the large users, and the reduction of the fixed charge had tempted them to join the system in rapidly increasing numbers. At the same time the financial results of operation under the revised schedule of rates proved eminently satisfactory. Notwithstanding the radical nature of the reduction, the new level of rates still yielded a surplus of receipts over operating expenditures more than sufficient to defray the cost of fresh construction as well as of maintenance. Hence in the June session of the Federal Assembly, 1892, the Federal Council was invited to draft a scheme for a fresh reduction of rates, by which small users, especially those dwelling in the rural districts, where the average amount of local traffic per subscriber was smallest, would obtain further relief.

The Federal Council conceded that rural telephone users were entitled to greater consideration as compared with the large urban users than had been accorded to them by the law of 1889. The public, however, it asserted, had obtained a wrong impression concerning the financial condition of their telephone undertaking. To be sure, the business was still profitable, but several circumstances made it inexpedient to proceed at once to a further consider-

¹ The progress of the movement aiming at a new reform of the local rates may be traced in the following messages of the Federal Assembly: —

- (1) Oct. 15, 1892; *Bundesblatt*, 1892, v, 313;
- (2) April 28, 1893; *Bundesblatt*, 1893, ii, 769; and
- (3) March 13, 1894; *Bundesblatt*, 1894, i, 779.

able reduction of rates. In the first place, the steady and rapid increase of subscribers then taking place was not, from a financial point of view, an unmitigated blessing. For until the whole exchange area was developed, the addition of new subscribers commonly occurred at a constantly increasing average distance from the exchange, and hence the cost of construction per subscriber tended also to increase. In cities the congestion of wires had already made necessary the replacement of open wiring by cables, a change which entailed likewise an enhanced cost of construction, whereas its effect on the charges for maintenance was as yet uncertain. The cost of inter-urban lines was also increasing, since their increasing number was requiring the introduction of metallic circuits. Finally, the rapid growth of electrical undertakings of high power, electric lighting and street railway systems, which then seemed imminent, would entail the construction of costly protective devices for the local lines in all large cities at the expense perhaps of the telephone administration. Since at least some profit was indispensable for the maintenance of the telephone service at a satisfactory standard of efficiency, the time appeared inopportune for a reduction of rates.

The Federal Council, however, was of the opinion that the rates should be reformed in the interest of small users without causing a change in their general level. The limit of unpaid local calls under the act of 1889 had been fixed too high. The Council declared that the limit should be made lower and the fixed portion of the local rate should be correspondingly reduced. Such a change would benefit small users everywhere without in any way burdening large users. Accordingly it suggested that the Federal Assembly fix the lump charge at 100 francs the first year, 80 the second, and 60 the third and each succeeding year, and charge 5 centimes per call for each call in excess of 400 (instead of 5 francs a hundred in excess of 800, as formerly). This proposal would have effected a real reduction for all originators of less than 800 calls a year, that is, for much more than half of the whole body of subscribers.

These proposals were received with indifference by the commercial interests in the large cities. They realized that they could not

reasonably ask for fairer treatment than they were already receiving at the hands of the government, and by protestations were more likely to injure than to promote their cause. The rural interests, however, were dissatisfied. They contended — and the Federal Council conceded — that the local service was worth less in small rural communities than in the cities, and clamored for greater concessions. For example, in behalf of the rural subscribers in the canton of Zurich, the cantonal government sent in a memorial, urging the abolition of mileage charges on lines within thirty kilometers of the exchange office, and the extension of the local rates to all stations located within that distance of "central." Such a sweeping reduction (it amounted to the abolition of all toll charges for distances up to thirty kilometers)¹ was more than the Federal Council saw its way to conceding,² although it agreed with its memorialists that rural subscribers were justified in seeking special terms. The general level of the rates, it declared, must be maintained at 80 francs per station, as computed in 1889, and since it could not think of raising the rates charged to large users, it felt bound to adhere to its proposals of 1892. So the matter rested for a year.

Meanwhile remote rural subscribers were coming to the conclusion that half a loaf was better than none. Since they could obtain neither the reduction of toll rates nor the abolition of mileage charges, they determined to secure as liberal concessions as possible for rural subscribers generally, whether to a public or a private branch exchange. In its message of 1893,³ the Federal Council had suggested an alternative schedule of local rates for the benefit of small users; namely, the complete abolition of the unpaid limit and the reduction of the lump charge to 100 francs the first year, 75 francs the second, and 50 the third and each succeeding year. This alternative was less advantageous to originators of more than 200 local calls a year than the Council's prior proposal, but was more favorable to smaller users, and was suggestive as indicating the possibility of a complete transition to measured service rates. Rural subscribers continued their agitation for reform,⁴ and,

¹ Of the 155 inter-urban lines operated in 1892, only 35 exceeded 30 kilometers in length.

² *Bundesblatt*, 1893, ii, 770.

³ *Ibid.*, 791.

⁴ Cf. the Memorial of the Cantonal Government of Berne, reprinted in the Federal

although the Federal Council in its message of 1894 refused to modify its earlier proposals, they succeeded in forcing the issue in the Federal Assembly. The result was the passage at the December session, 1894, of a second law for the purpose of reducing telephone rates.¹

The Assembly held to the opinion of the Council that the mileage charges could not be reduced without both injustice to urban subscribers (for the cost of construction in rural districts at that time was often greater than in urban, since fewer wires were put up on a single line of poles) and danger to the telephone finances. But the proposal for the complete abolition of the unpaid limit in the schedule of local exchange rates met with its approval, and in order not to lose the advantages of either of the two proposals advanced by the Federal Council, it combined them both. The law as finally enacted provided that subscribers should pay five centimes for each local call and that the lump charge should be reduced to 100 francs the first year, 70 the second, and 40 the third and each succeeding year. The same rates were later extended to public pay stations maintained under guarantee by village authorities,² and criticism of Swiss telephone rates vanished.³

The new rate law went into effect in 1895. It marked not only the end of Swiss agitation in respect to telephone rates, but also that of the transition from flat rates to a logical system of measured-service rates. The Swiss schedule of 1895 is not above criticism. It fails to make provision for the more economical use of their lines by the large users. Some reduction of the message rate for such users would not appear unreasonable, but has not yet been called for by the interests concerned. Yet in its general features it represents a theory of rate-making which other countries either have adopted after a delay of ten or twenty years, or will eventually adopt.⁴

Council's Message of 1894. Rural subscribers in Berne were now content to ask for abolition of the unpaid limit plus the reduction by one third of the mileage charges.

¹ *Bundesgesetz, betreffend die Ermässigung der Telephongebühren vom 7. Dez., 1894.*

² *Verordnung betreffend das Telephonwesen vom 25. Sept. 1895.*

³ Its last appearance was in the shape of a petition from the Swiss Agricultural Society, praying for the abolition of mileage charges. This petition met with no response in the Assembly. Cf. *Bundesblatt*, 1895, I, 288.

⁴ Cf. Reinhard, pp. 116-124.

The Swiss people have used their control over telephone rates wisely. Relying upon the publicity of accounts and statistics of operation and upon popular discussion under the guidance of a responsible administration, the representatives of the people have hammered out a consistent and scientific schedule of rates. No section of the community has abused a dominant position in the government to secure advantages at the expense of other sections; personal discrimination has been eliminated without local discrimination being allowed to take its place; and the utmost popularization of the service consistent with a sound financial condition has been deliberately adopted as the fundamental aim of governmental telephone rates.

Whether or not the Federal Assembly was too bold in its interpretation of the accounts laid before it by the Council, will be left for subsequent experience and the following chapter to reveal.¹ At the present moment, it will suffice to point out that the business policy pursued by the Swiss telephone authorities, combined with the rate policy adopted by the representatives of the people, secured for Switzerland a more rapid introduction of the telephone than took place anywhere else in Europe or America. In 1895, when the second reformed schedule of rates went into effect, Switzerland possessed one telephone in use for each 129 inhabitants. At the same date in the United States, the companies under the control of the American Bell Telephone Company, which then enjoyed an almost exclusive monopoly of the telephone business, reported 281,695 telephones in use, or one to about 245 inhabitants. Comparative statistics of this sort are not to be interpreted too narrowly, but so far as they contain a meaning, it is that the establishment of the telephone business by the Swiss people had been distinctly a success. They had not avoided mistakes, but they had demonstrated that by retaining full control of the telephone business in their own hands they had retained also the power promptly to correct their mistakes.

¹ The effect of the second reform of the exchange rates was to reduce the average annual payment per subscriber almost to 60 francs, or two fifths of the flat rate in force prior to 1890.

CHAPTER XIII

FURTHER DEVELOPMENT OF THE SWISS TELEPHONE SYSTEM

THE immediate financial result of the second revision of the local exchange rates was favorable beyond all expectations.¹ In 1890, the effect of the partial introduction of measured-service rates had been a falling-off of over 27 per cent in the number of local calls as compared with those of the last year under the flat rate. A similar falling-off as a consequence of the complete introduction of measured-service rates by the act of 1894 had been anticipated, but the annual average number of local calls per telephone actually fell off only from 608 in 1895 to 529 in 1896, or by barely 13 per cent.² The increase in the number of new subscribers was greater than ever before, and in consequence the financial condition of the service was materially improved by the second reform of rates. The rate of amortization of the fresh capital which had been invested in the business since 1890, was raised from 10 to 15 per cent, and in 1896 there still remained a small net profit.³ This, instead of being paid into the Federal Treasury as a net profit, was appropriated to the further reduction of the outstanding indebtedness incurred on account of construction. Since the telephone administration furthermore paid 4 per cent interest on all other advances made to it by the Federal Treasury, the soundness of its financial statement is indisputable.

This healthy condition was not destined long to continue. A clear understanding of the telephone policy of the Swiss government requires an explanation of the circumstances which for a time appeared likely to plunge the telephone undertaking into chronic insolvency. The explanation of the first of these circumstances requires a digression concerning the relations between the tele-

¹ The act of 1894 went into effect Jan. 1, 1896.

² *Geschäftsbericht des Bundesrates pro 1896*. Bundesblatt, 1897, ii, 838.

³ *Geschäftsbericht des Bundesrates pro 1893*. Bundesblatt, 1894, i, 748. *Ibid.*, *pro 1895*. Bundesblatt, 1896, ii, 680.

phone administration and the public in the matter of rights of way for its lines and also concerning its relations with other electrical undertakings.

In 1888 the Federal Supreme Court decided that the telephone authorities had no right to make use of private property for the support of telephone lines without compensation to the owners.¹ This decision, it was calculated, if acted upon by every householder in the towns and cities, would increase the cost of service in such places by 15 francs per telephone per annum. Two years earlier, the municipal authorities in Zurich challenged² the assumed right of the telephone administration to locate a cable under the public ways without their permission. The telephone administration claimed that it had that power under the act conferring upon it the monopoly of the telegraph business. But in view of the different circumstances governing the construction of telegraph and of telephone lines, the claim was doubtful, and the administration was glad to compromise with the local authorities. The latter consented to the laying of the cable, with the understanding that they might at any time order its relocation, provided that they paid one half of the costs. Similar conflicts of interest were beginning to arise in all the larger Swiss cities. Thus in 1889, in Basel,³ the municipal authorities refused their authorization for the use of their streets for underground cables, unless they were permitted to prescribe the location. Their purpose was to preserve a free hand for dealing with the location of their own contemplated electric lighting lines. This controversy was not settled until the following year, when the telephone authorities received the desired location on condition that they raised no objections to the later utilization of the same ways by the local authorities for their electrical conductors.

This uncertainty concerning legal relations to the public was not only a great inconvenience to the telephone administration, but seriously perturbed the computations on the basis of which it was just then endeavoring to reform its system of rates. Hence, at the

¹ *Geschäftsbericht des Bundesrates pro 1888*. Bundesblatt, 1889, ii, 283.

² *Geschäftsbericht der Stadt Zürich pro 1886*, pp. 12-14.

³ *Verwaltungsbericht Basel-Stadt pro 1889*, vi, 2. *Ibid.*, *pro 1890*, vi, 3.

same time that the Federal Council announced its suggestions for the reform of the rates, it published a proposal for the determination of the relations between the public and the telephone administration.¹

The prime purpose of this bill was to secure to the telephone administration power to erect its lines upon alien property. The law of December 23, 1851, concerning the establishment of a telegraph system, provided that the federal authorities should arrange with the cantons for rights of way over cantonal and municipal property. In practice the cantons had always been willing to grant rights of way *gratis*, and until the coming of the telephone there had been no questions raised. The Federal Council now proposed that this practice should be authorized by law for both telegraph and telephone.

At the same time the Council proposed to regulate the relations between the telephone and the power-circuit electrical undertakings, which could even then be descried looming ominously on the horizon. The danger to the weaker installation from induction and direct contact with the stronger was already understood, and though as yet the application of powerful electrical currents to industrial purposes in Switzerland was scarcely begun, the conversion of the Alpine country's numerous waterfalls into mighty electrical power stations had become the fair dream of many a native engineer of imagination and patriotism. Sharing these high hopes and sincerely desirous of hastening the day of their realization, the Federal Council could not fail to foresee difficulties for its telephone system. So far as possible, it declared, the conductors of large currents should be placed at a safe distance from the telephone lines. But in some cases this would not be possible except at such a heavy cost as would tend to impede the development of the electrical industry. Hence the Federal Council recommended that promoters of power-circuit undertakings be required to construct their plants, so far as electrical science would allow, in such a way as to create the minimum of disturbance in telephone circuits, promising, for

¹ *Botschaft des Bundesrates an die Bundesversammlung über ein Bundesgesetz betreffend die Einrichtung von elektrischen Linien (vom 13. Nov. 1888)*. Bundesblatt, 1888, iv, 680.

its part, that under exceptional circumstances the government would waive its right to forbid the construction of perturbing conductors in the neighborhood of its telephone lines. But the government would require compensation for damages occurring to its property in consequence of such a renunciation of its rights. In order to insure the observance of their obligations towards the telephone authorities, the Council's bill stipulated that the promoters of power-circuit undertakings should give notice of projected works, and secure the approval of the Council for their plans to protect the telephone lines.

The publication of this message marks the opening of a struggle in Switzerland similar to that which took place in Germany. Electrical engineers and industrial promoters generally saw at once that the acceptance by the Federal Assembly of the Council's proposals would deliver the power-circuit undertakings defenseless into the hands of the telephone authorities. However generous might be the instincts of the Federal Councillors, the paid officials at the head of the telephone undertaking would be bound to consider first the interests of the particular undertaking committed to their care, and only secondarily could they be expected to give heed to those of the electrical industry at large. The Swiss Association of Engineers and Architects promptly came to the front with a memorial in support of an alternative bill of its own, and the local authorities of the leading Swiss cities and of the cantons in which water power was abundant, who were even then enjoying the prospect of becoming the chief promoters of electrical undertakings in Switzerland, lent to the Association their powerful support.¹

The effect of this remonstrance against the proposals of the Federal Council was to bring about a careful and thorough discussion of the bill in the Federal Assembly. Both the Assembly and the Council showed a disposition to meet the remonstrants at least halfway, and the final form of the ensuing compromise was sug-

¹ *Geschäftsbericht der Stadt Zürich pro 1889*, p. 9; *Verwaltungsbericht Basel-Stadt pro 1889*, i, 3, etc. The city of Geneva seems to have been the leader in this remonstrance, although its published reports contain no record of its part in the affair. All these and many smaller cities were already planning the construction of municipal electrical undertakings. The memorial of the Swiss Architects' and Engineers' Association is reprinted in the protocol of the debates in the Federal Assembly.

gested by Federal Councillor Welti, in whose department the responsibility for things electrical, so far as the Confederacy was concerned, was vested.

The law of June 26, 1889, provided that the promoters of power-circuit undertakings should so construct their systems as not to disturb present or future telephone lines. The telephone administration, on its part, was bound to take all reasonable precautions to prevent the disturbance of its lines. If the two parties could not agree on the measures of protection which each was to take in a given case, the final decision should rest with the Federal Council, after it had taken the opinion of a disinterested expert. The costs should be apportioned between the parties by agreement, in default of which the Federal Court should determine the share of each party according to the following principles:—

(1) the cost of special works required on a later installation for the protection of an earlier one must be borne by the later;

(2) the cost of alterations in earlier lines to avoid injury by a later installation, provided the earlier was itself a technically sound installation, must be borne by the later, but an exception was made in favor of later electrical undertakings serving a public purpose (i. e., public lighting plants, etc.); and

(3) in other cases, each undertaking must bear the costs arising on its own installation.

The telephone authorities, but not other electrical promoters as desired by the Swiss Engineers' and Architects' Association, were given a right of way without charge over public and private property, but were required to make due compensation for damages committed in the course of construction and for any prejudice that might be created to the owners of private property by the existence of lines upon their land or buildings.

In this form the act of 1889 appeared to anticipate all the contingencies that could be foreseen at that stage of electrical enterprise. Both sides appeared satisfied with the termination of the discussion in the Assembly, and in fact for several years it met the needs of the situation admirably. But the law contained three defects. It did not anticipate the eventual necessity of the introduction of metallic circuits in all urban exchange systems; it pro-

vided no adequate machinery for its enforcement; and it created a strong incentive for the promoters of power-circuit undertakings to wrangle with the telephone administration concerning which among these undertakings should undergo alterations for the protection of the telephones.¹

Electrical street railways were the particular variety of electrical undertaking that was destined to prove a source of trouble to the telephone. In 1889 only one of the Swiss street railways was operated by electricity (the line on the shore of Lake Geneva from Montreux to Chillon), and this road employed a system of traction which so completely insulated the current from the earth that no perturbing influence was perceptible in the neighboring telephone circuits.² At that time steam, cable, or compressed air seemed as likely as electricity to constitute the motive power for the urban transportation of the future. But in 1893³ the first trolley road was opened at Zurich; in 1894, trolley roads were opened in Basel and Geneva; and in 1895⁴ the troubles of the telephone administration really began with the opening of a trolley road at Lugano without previous notice to the Federal Council. In the earlier instances,⁵ the main telephone lines were put underground in cables, or fuses were inserted at the terminals of the lines in the exchange,⁶ and a portion of the expense was borne by the street railway promoters, but at Lugano the promoters proceeded without the knowledge of the telephone authorities, with the result that the local exchange system was completely paralyzed by the opening of the road⁷ and had to be reconstructed with metallic circuits. Shortly afterwards, the city of Zurich purchased all the old horse railways within its limits and proceeded to transform them into electrical railways. The municipal authorities made an agreement⁸ with the telephone administration by virtue of which the disposi-

¹ Cf. *Verordnung des Bundesrates über die Erstellung von Telegraph- und Telephonlinien* (vom 7. Dez., 1889); A. S. n. F., xi, 324.

² *Geschäftsbericht des Bundesrates pro 1892*. Bundesblatt, 1893, ii, 220.

³ *Ibid.*, pro 1893. Bundesblatt, 1894, i, 755. †

⁴ *Ibid.*, pro 1895. Bundesblatt, 1896, ii, 688.

⁵ *Ibid.*, pro 1894. Bundesblatt, 1895, ii, 524.

⁶ *Ibid.*, pro 1894. Bundesblatt, 1895, ii, 531.

⁷ *Ibid.*, pro 1896. Bundesblatt, 1897, ii, 852. †

⁸ *Geschäftsbericht der Stadt Zürich pro 1898*, p. 225.

tion of the aerial telephone wires to be affected by the projected trolley system was arranged, but the division of the costs was reserved for later determination.

The telephone administration was reluctant to assume all the burden of the transformation of urban aerial lines with earth return into underground metallic circuits, since the necessity for the transformation was only partially the result of the development of the telephone system itself. Even assuming that ultimately the transformation would have been inevitable without the development of the power-circuit undertakings, it was undeniable that the rapid development of that branch of the electrical industry had contributed largely to the precipitation of the problem. Consequently the telephone administration felt justified under the law of 1889 in asking the latter interests to assume a portion of the cost. At the same time the administration was conscious of the danger of delay, and proceeded with the transformation without waiting for a solution of the vexed problem.¹ By the end of 1898, 30,000 kilometers out of the total of 85,000 kilometers of exchange line were metallic circuits, and an even larger proportion of the exchange wire was underground.² The cost of doubling the local lines and putting them underground amounted by the end of 1898 to nearly six million francs, of which 2.5 per cent had been contributed by the power-circuit interests.³ Yet the work was not half done.

In this same year events occurred which showed that the process of transformation could not be retarded until the division of the costs should be determined, but that the administration must complete the work as quickly as possible, whatever the expense. In Zurich, a telephone wire came in contact with a trolley wire,⁴ and owing to a defective fuse (or the lack of one) at the "central," the exchange offices and all the valuable equipment were destroyed by fire. Exchange operations were consequently interrupted for weeks. In Basel, the same thing happened, the telephone wire fell to the

¹ *Geschäftsbericht des Bundesrates pro 1896*. Bundesblatt, 1897, ii, 852.

² *Ibid.*, pro 1899. Bundesblatt, 1900, ii, 352.

³ *Stenographisches Bulletin der Bundesversammlung*, 1900, p. 604.

⁴ *Botschaft des Bundesrates an die Bundesversammlung betreffend die Finanzlage des Bundes (vom 26. Mai, 1899)*. Bundesblatt, 1899, iii, 293, at p. 258.

street, and a bystander was killed.¹ In La Chaux-de-Fonds, a heavy snowstorm caused the telephone wires to fall on the electric lighting conductors,² with the result that the lighting plant had to be shut down until the telephone wires could be removed. In each case the promoter of the power-circuit undertaking was the local municipal government. The result of all these catastrophes was that the telephone administration determined to complete the transformation of its urban exchange systems as rapidly as possible, and then to recover what it could from the disturbing power-circuit undertakings.

The more vigorous policy of reconstruction was inaugurated in 1898, and in the following year the government's proposals for financing the work of reconstruction were published.³ The message of the Federal Council proclaimed the necessity of a more stringent supervision over electrical undertakings of all sorts by the federal authorities, and of the complete insulation of telephone circuits from the earth in order to protect them from the pernicious influence of power-circuit undertakings. In the cities the introduction of metallic circuits alone would not suffice; the lines would have to be put underground. The Federal Council conceded all these technical points to the representatives of the power-circuit interests, and the only question in its mind concerned the apportionment of the expense of the transformation.⁴ Nevertheless, the telephone management was opposed to the unconditional surrender of the earth to the power-circuit branch of the electrical industry, and asserted that much might be accomplished by the more careful insulation of power-circuit conductors with a view to the continuation of the joint use of the earth by both branches of the industry. The telephone management laid especial stress on the consideration that the Swiss rates were adjusted to the old method of telephony which required the use of the earth for the return of the currents, and that it could not make both ends meet

¹ *Verwaltungs-Bericht Basel-Stadt*, 1898, iv, 40.

² *Schweizerisches Zentralblatt für Staats- und Gemeindeverwaltung*, iii, p. 167.

³ *Botschaft des Bundesrates an die Bundesversammlung über den Erlass eines Gesetzes betreffend die elektrischen Schwach- und Starkstromanlagen* (vom 5. Juni, 1899). *Bundesblatt*, 1899, iii, 786-890.

⁴ The Federal Council referred to the discussion of the same question in Germany.

if it were forced to go over unaided to a more expensive mode of conducting the business. Unless the other electrical interests could be made to pay a greater share of the cost of transformation than they had paid in the past (2.5 %), the early completion of the work could be secured only by the sacrifice of the financial soundness of the telephone undertaking, or by the raising of the rates.

At that time (1899), electric street railways were in operation or under construction in sixteen cities (i. e., more than the total number of cities of over 10,000 population), and to complete the transformation in these cities alone would cost eleven million francs. Such a sum would have more than doubled the existing capitalization of the Swiss telephone undertaking; that is, the sum of the advances made out of the Federal Treasury for fresh construction since 1890, less the share of the profits paid on account of amortization (10% of the advances until 1895, then 15% plus the further surplus). On account of the savings in charges for maintenance which could be expected from the transformation, the telephone management calculated that it could finance the work if it were spread over a period of ten years; but if the contention of the power-circuit interests, namely, that the entire Swiss system be rebuilt at once at the expense of the government, should be accepted by the Federal Assembly, the immediate result would be an enormous deficit. The Federal Council, unless it should abandon its purpose to complete the reconstruction of the telephone system, was forced to choose between the alternatives of raising the rates or throwing a portion of the cost of the transformation upon the power-circuit interests, who were, for the most part, municipal and cantonal governing authorities.

The Federal Council chose the latter alternative, and planned such a revision of the law of 1889 as would enable the work of transformation to be carried out as a joint undertaking by all the interests concerned. With this end in view, it proposed that the provisions of the law of 1889 governing the apportionment of costs between conflicting electrical interests should be repealed. The principle that the earlier installation should have a superior claim to consideration was declared to be unsound. The questions arising out of the necessity of protecting weak currents from strong ones

should be decided solely with regard to the efficacy of the measures proposed to be taken, and the division of the costs should not be allowed to affect the matter. Hence the Federal Council suggested that the law be so amended as to insure the most effective separation of strong and weak currents, regardless of the proprietorship of the conductor on which special work might have to be done, and that the expense should be shared in a fixed proportion between the interests concerned. As a fair proportion of the joint expense for the telephone undertaking to bear, the Federal Council suggested one third.

In order to prevent the recurrence of the unprofitable disputes which were arising under the existing law in regard to the choice of the conductor on which special works for the protection of a telephone circuit should be performed, it proposed the creation of a special electro-technical commission. To this commission, composed of seven representative experts to be designated by the Federal Council upon the recommendation of the various sections of the electro-technical industry, should be intrusted the task of advising the Federal Council, upon which should rest the final responsibility for the drawing up and periodical revision of suitable regulations to govern the relations of the various electrical undertakings to one another. The Federal Council, however, specifically included under the head of works to be carried out as joint undertakings by all the electrical interests, not only the relocation of telephone lines threatened by a projected electric railway, but also the general substitution of metallic circuits for aerial single wires with earth return.

The publication of this message was far from allaying the criticism of the telephone administration in electro-technical circles.¹

¹ Before the publication of the message, a commission of experts was appointed jointly by the Federal Council and the Swiss Electro-technical Union — an association of electrical manufacturing and operating corporations, many of the latter being municipal or cantonal authorities — whose findings were reported in the *Protokoll der Schlussitzung der experten Kommission*, 1898, 126 pp. The telephone administration had stated its case in a memorial entitled *Das Verhältniss der Stark- und Schwachstromanlagen*, 1899, 43 pp.; and the legal aspects of the question had been fully discussed by Professor Meili in *Schweizerische Zeitsfragen*, Heft 29, *Die elektrischen Stark- und Schwachstromanlagen*, and in the reply to the same by Dr. A. Denzler. After the publication of the message, Professor Meili wrote another pamphlet,

The Federal Assembly inclined in favor of the power-circuit interests, and although the parliamentary struggle was protracted by the efforts of the energetic Herr Zemp, the Federal Councillor, in whose department were vested the postal and telephone services, as well as the newly nationalized railroads, the ultimate outcome could hardly be doubtful.¹ In 1901, after prolonged negotiations, the telephone administration made a special arrangement² with the local authorities at Basel by which the latter paid only one third of the costs of protecting the telephone against the municipal street railway and the administration paid two thirds. In the following year (1902), the parliamentary struggle was terminated by the law of June 24. By this law the entire cost of the introduction of metallic circuits was thrown on the shoulders of the telephone administration, and only the costs of relocating aerial lines displaced by trolley lines were divided between the telephone administration and the power-circuit interests in the proportion originally suggested by the Federal Council. The latter's proposal of a permanent electro-technical commission of seven representative experts to advise the Federal Council in the adjustment of the detailed relations between the conductors of strong and weak currents was accepted, but so modified that the power-circuit interests should secure the major share of representation.

This solution of the problem must be regarded as an excellent one. The power-circuit undertakings collectively far exceeded the telephone in importance to the public at large, and it was manifestly contrary to the public welfare that its interest in its telephone undertaking should be allowed to outweigh its greater, though less direct, interest in other electrical undertakings. The method of apportioning the costs of necessary relocations of telephone lines was arbitrary, yet a fixed apportionment of cost, even though arbitrary, is more easily borne by industrial interests than a

Schweizerische Zeitfragen, Heft 30, *Der Schweizerische Gesetzentwurf über Stark- und Schwachstromanlagen*, and memorials were handed in to the Federal Council by the Swiss Electro-technical Union, by the Railway Association, and by a number of promoters of power-circuit undertakings.

¹ *Amiliches stenographisches Bulletin der schweizerischen Bundesversammlung*, 1900, pp. 555 ff; 1901, pp. 248 ff., pp. 498 ff., pp. 536 ff.

² *Verwaltungsbericht Basel-Stadt*, 1899, iv, 43; 1900, iv, 42; 1901, iv, 42.

more rational but uncertain apportionment. The condemnation of the telephone administration to pay all the costs of introducing metallic circuits was undoubtedly fair, but it had the unfortunate effect of putting an unexpectedly heavy strain on the finances of the telephone undertaking.

The second cause of the failure of the rate act of 1894 to keep the telephone finances on a permanently sound footing was internal. It has been already shown that the immediate effect of the successive reforms of the rates in 1889 and 1894 had been to give an unprecedented impulse to the expansion of the telephone business. The attractiveness of the rates brought fresh subscribers to the system within the first two or three years succeeding the final reform, at a more rapid rate than could be maintained after the exceptional impulse had exhausted itself. Hence during the later nineties the annual increase steadily diminished.¹ The official constructing engineers and traffic managers, who were anticipating the maintenance of the rapid growth of the previous years, planned the necessary extensions of plant, and the Federal Assembly approved the necessary appropriations. But the universal expectations were disappointed. The falling-off in the rate of fresh accessions to the system caused a decline in the average annual payment per subscriber and a shortage in the anticipated number of subscriptions. Hence, during several years from 1898 on, the operating receipts regularly fell short of the budgetary estimates. At the same time the extraordinary increase of capitalization, and consequently of fixed charges, caused by the conflict with the power-circuit undertakings, brought it to pass that the annual expenditures regularly exceeded the estimates. In the year 1899, a deficit of over one million francs appeared.²

¹ Year	1896	New Exchanges	27	New Subscribers	4,555
"	1897	"	24	"	3,756
"	1898	"	12	"	3,072

² *Botschaft des Bundesrates an die Bundesversammlung betreffend die Finanzlage des Bundes (vom 26. Mai, 1899)*. Bundesblatt, 1899, iii, 293. Cf. also the annual reports of the telephone administration for each year, which are printed in *Geschäftsberichte des Bundesrates* along with the other reports of the activities of the postal and railway department. See esp. Bundesblatt, 1899, ii, 370; 1902, ii, 618; 1903, ii, 397; and *Stenographisches Bulletin des Bundesversammlung*, 1900, p. 616, statement of Herr Zemp.

In the following year, to the continued and even intensified operation of the factors already pointed out was added another, the automatic increase of wages in the telegraph and telephone service by virtue of the general salaries act of 1897. This act had reclassified the federal civil service, established maximum and minimum rates in each branch of the service, and provided for the regular promotion of all employees of good standing at intervals of three years by successive stages from the minimum to the maximum for their respective classes. The first interval of three years terminated in 1900. The effect, so far as the telephone business was concerned, was a general increase of wages and salaries in the face of vanished profits. The general salaries act in itself was unquestionably commendable, but its operation at that particular moment served to increase the discomfiture of the telephone administration.

The deficits increased each year until 1902. That was a year of general commercial depression throughout all Europe. In Switzerland it was also the fiftieth year of the existence of the state telegraphs. In a memorial¹ published on the occasion of the anniversary, the Swiss telephone authorities discussed among other matters the financial plight of their undertaking and its prospects for the future. The prime cause of the crisis in its affairs was declared to be the disproportionate increase of fixed charges in the preceding half-decade as compared with the increase of business. Hence a general level of rates, calculated with a view to the conduct of the business by less expensive methods, had for the time being proved inadequate to meet the altered situation.

In the December session, 1901, the Federal Assembly requested an explanation of the unprofitable turn of telephone affairs and suggestions for a remedy. The telephone administration in reply proffered two proposals: (1) to raise the rates; and (2) to reduce the fixed charges by deducting from the capital to be amortized the value of the plant (i. e., its cost of reproduction less depreciation). The latter of these alternatives, provided the maintenance of the

¹ *Das Telegraph- und Telephonwesen in der Schweiz von 1852 bis 1902. Festschrift auf das fünfzigjährige Jubiläum der Schweizerischen Telegraphenverwaltung.* Herausgegeben von der Schweizerischen Telegraphen-Direktion. Berne, 1902, p. 204.

plant was well provided for, as was in fact the case, would have been the ordinary commercial practice. The Swiss policy, however, was not to build up as large a paying investment of capital as possible, but to own its undertaking clear. Hence it resolutely adhered to the policy of repaying each year as large a portion as possible of the desired 15% of the capital, and stated the amount by which it fell short of the required sum for amortization as deficit. This made the reported deficit appear much worse than it really was, for 15% per annum was a much higher rate of amortization than was required to accord with the ordinary practice in the telephone business. At the time the telephone administration made these proposals, the Federal Council was disinclined to give effect to them until the definite establishment of the financial relations between the telephone and the power-circuit electrical interests. Although that matter was soon determined adversely to the telephone, the Federal Council was still unwilling to abandon its financial and rate policies. Already by a relentless pruning of expenditures for fresh construction, and the normal, if slow, increase of connections, the margin between income and outgo was beginning to diminish, and it could foresee that with the lapse of time the continuance of the policy of economy, in the absence of the creation of fresh unexpected liabilities such as that created by the introduction of metallic circuits, would in itself suffice to restore the equilibrium of the telephone undertaking.¹

In 1903 the deficit was greatly diminished. The transformation to metallic circuits was nearly completed in the forty-eight largest exchange systems, and, since the most urgent work was finished, the rate of reconstruction could be slackened. The average income per subscriber and the rate at which new accessions to the system were received began to increase. In 1904 the deficit was still further reduced, and in 1905 it disappeared altogether. The rate of amortization in that year exceeded 15% for the first time since 1897, and the capitalization, which had actually been diminished between 1902 and 1905, was less by nearly five million

¹ *Bericht der Kommission des Nationalrates über die Geschäftsführung des Bundesjahres im Jahre 1901 (vom 26. Mai, 1902).* Bundesblatt, 1902, iii, 564. *Geschäftsbericht des Bundesrates pro 1903.* Bundesblatt, 1904, ii, 533.

francs than the estimated value of the productive plant. In 1906 the demand for telephone facilities had so far overtaken the supply that the capitalization had to be increased once more to provide funds for the needed fresh construction.

This financial episode is almost unique in the history of telephony. In almost all other countries, the transformation of single-wire telephone systems to metallic circuits required a readjustment of the telephone finances, in order to avoid a lowering of the standard of service. In Switzerland the standard of service was maintained to the satisfaction of the public, and at the same time the reconstruction was consummated without raising the rates.

As soon as the process of doubling the subscribers' lines was approaching its conclusion, the work of substituting the common battery for the magneto method of exchange operation was begun in the larger cities, and at the same time plans were taken up again, where dropped half a dozen years before, for the modification of the conditions of service in the interest of the public.¹ The business hours in some of the smaller exchanges were lengthened,² and the 462 remaining small exchanges — being those at which less than 15,000 local talks took place per annum, that is, those with no more than thirty or so subscribers — enjoyed the limited day service. The smaller exchange systems were privileged to maintain all-night service by making their own arrangements for attendance. More than this, the telephone administration did not yet feel able to do. The abolition of toll charges on all messages transmitted less than 10 kilometers had been proposed in 1899,³ and again in 1905,⁴ but the Federal Council advised that the Assembly defer such a reduction⁵ until they were surer of the financial stability of the undertaking. The advice was accepted.

¹ *Geschäftsbericht des Bundesrates pro 1905*, pp. 638–728. The Federal Council felt obliged to proceed cautiously with its plans for the improvement of the service, because wages and the cost of material were rising, and because the projected introduction of electric motive power on the federal railways would make necessary the relocation of most of the inter-urban toll lines at great expense. See especially p. 641.

² *Verordnung vom 5. Okt., 1906*, A. S. n. F., xxii, p. 598.

³ *Geschäftsbericht des Bundesrates pro 1900*. Bundesblatt, 1901, ii, 764.

⁴ *Ibid.*, pro 1905, p. 648.

⁵ This would have applied to 10% of the whole toll business.

A more moot point related to the reduction of the obligations imposed on rural villages which sought telephone connection with the nearest telegraph office or telephone exchange. The liability of the local authority was the same as that incurred by a private person who installed a public call office on his premises; that is, the local authority paid the regular charges established by the law of 1894, and recouped its expenditure by a surtax on outgoing calls (5 centimes on local calls, 10 centimes on inter-urban, and 15 on telegrams telephoned to the nearest telegraph office). The department could not make these conditions any lighter, but it could help isolated rural communities by modifying the conditions of the establishment of telegraph offices. The latter had remained unchanged for over forty years after their regulation in 1857. The local authority had been required to furnish poles and a right of way for the line, and a location for the office, or commute the same by a payment of money, and to pay an annual contribution of 100 francs a year for ten years. After ten years, if the office did not dispatch 1000 telegrams a year, the village authorities were required to continue to pay 100 francs a year, or if the office dispatched more than 1000 but less than 2000 messages, 50 francs a year. They were relieved of the payment, however, if they continued to place a location for the office at the disposal of the telegraph service. Otherwise, the administration might abandon the office. In fact, 3000 originating messages were necessary to make such a rural office pay. In 1897, the majority of the rural offices (1100 out of 1997) did not produce 3000 messages a year, and 703 produced less than one telegram a day. All these offices were kept open by the telegraph authorities at a loss. Indeed in 1897, 599 of these unprofitable offices had been in operation over ten years, and the village authorities were paying the supplementary guarantee rather than be deprived of their prompt connection with the outer world.¹

The Federal Council could not recommend that these conditions be made lighter except by abolishing the supplementary guarantee after ten years, since the result would have been to transfer a larger share of the existing loss on such offices to the

¹ *Geschäftsbericht des Bundesrates pro 1897*. Bundesblatt, 1898, ii, 598.

telegraph undertaking, and at the same time call into existence new offices with still poorer prospects of traffic. It could only suggest the transformation of the more unprofitable offices into telephone call offices, and in 1900 it made this transformation compulsory for all offices dispatching less than one telegram a day. Agitation by the village authorities continued, however, and in 1906 the obligations imposed upon them for both telegraph and telephone stations were materially modified by their release from all charges after the first ten years and from charges for office rent from the date of opening.¹

Since 1905 the growth of the Swiss telephone system has been more rapid than at any time since the year the rate law of 1894 went into effect. But the telegraph business has fallen off. Perhaps nowhere has the effect of the rise of the telephone upon the telegraphs been more pronounced than in Switzerland. The growth of traffic during the generation since the invention of the telephone is indicated by the following statistics of telegrams: —

<i>Year</i>	<i>Number dispatched</i>	
	<i>Total</i>	<i>Internal only</i>
1875	2,965,004	2,062,439
1880	2,842,340	1,751,018
1890	3,824,040	1,965,862
1902	4,180,622	1,474,095
1906	5,106,697	1,608,838

The total telegraph traffic has grown regularly up to this date, but if internal traffic alone be considered, the maximum was attained at the beginning of the period. In 1876 the telegraph rates were reformed by the replacement of message rates with word rates, and the general level of rates was so raised as to restore the equilibrium of the undertaking. The immediate result was a great falling off in the traffic. The traffic was recovering slowly, however, during the eighties, when the improvement of long-distance telephony introduced a new complication. The highest point of the recovery came in 1890, and then a new decline set in, to be followed after the commercial depression of 1902 by a new period of recovery. The prospect is, however, that this will be eventually suc-

¹ *Verordnung vom 5. Okt., 1906, A. S. n. F., xxii, p. 592.*

ceeded by a new period of decline. The growth of the long-distance telephone business, on the other hand, has been uninterrupted and rapid.

<i>Year</i>	<i>Talks</i>	
	<i>Inter-urban</i>	<i>International</i>
1890	576,493	
1902	5,093,198	122,235
1906	6,956,995	299,203

From 1880 to 1906 the number of kilometers of telegraph wire increased from 16,017.6 to 23,058.1, whereas the length of telegraph line reached a maximum in 1890, and has since declined, on account of the transformation of rural telegraph into telephone lines, by 18 %. In 1906 the length of telephone wire was 273,162 kilometers. The connection between these facts is so obvious as to require no comment. Yet the telegraph service is well maintained and, on account of the constant growth of the international and transit traffics, it is still possible to make both ends meet.

During the fifty-two years, 1855-1906, the total receipts from the telegraph and telephone undertaking were 192,270,272.24 francs, and the total expenditures were 189,024,777.82 francs. At the end of the period, the people of Switzerland possessed a well-preserved telegraph undertaking free of all charges, and a thriving telephone business, the assets of which exceeded the liabilities by nearly 25 %. The telephone service in the cities is maintained at a high standard of efficiency and is better patronized than anywhere in Europe outside of the Scandinavian capitals. But it is in the rural service that the Swiss system shows at its best. In 1906 the distribution of traffic among the 384 existing exchange systems was as follows:—

<i>No. of systems</i>	<i>No. of daily talks</i>
6	over 5000
9	1001-5000
9	501-1000
15	251- 500
51	101- 250
146	26- 100
148	25 or less

Besides these exchange systems there were no less than 905 rural village call offices.¹ If we examine the use of the system by the individual subscribers, the evidence points to the same conclusion.

<i>No. of subscribers</i>	<i>No. of annual local talks</i>
52	none
4865	1- 100
6870	101- 200
6469	201- 300
5348	301- 400
4445	401- 500
3686	501- 600
2901	601- 700
2280	701- 800
1880	801- 900
1474	901-1000
4174	1001-1500
1627	1501-2000
1237	2001-3000
629	3001-5000
250	over 5000

The highest average number of annual talks for all the subscribers to any one exchange system (1022) was in the largest exchange system, that of Zurich. The lowest (194) was in the small town of Brig. No one who has ever had the pleasure of traveling in Switzerland could fail to receive certain impressions which these figures strongly corroborate, namely, that the Swiss are a people who have individually a small use for the telephone, but that a smaller proportion of them feel no need of it than in almost any other country which a traveler is likely to see. A discussion of the statistics of comparative telephone development in the several countries will be found in a later chapter. In this place it suffices to point out that the Swiss by the public ownership of telephones have obtained exactly the kind of service they desired, and have obtained it on terms extraordinarily cheap.

It is impossible to follow the development of the governmental telephone business in Switzerland without being moved to admire

¹ *Geschäftsbericht pro 1906*, pp. 714, 718.

the facility with which the Swiss political institutions have lent themselves to the conduct of public business undertakings, and the ease and precision with which the machinery of public business organization operates. Some minor changes in the administrative organization of the system were made by the telegraph act of 1907,¹ but the main features of the previous organization remained unchanged. The responsibility for the management of the telegraph and telephone business is vested by the Federal Assembly, acting on behalf of the people, in the Federal Council. The latter assigns the actual supervision of the conduct of affairs to one of its members, and issues regulations in accordance with the telegraphs acts for the division of responsibility for business details between itself as a whole, the particular federal councillor at the head of the department under which the telegraphs and telephones are placed, and the permanent officials employed under him to perform the duties of business managers. These business managers are employed on account of their technical capacity, as lawyers or expert electricians might be employed. The rates are made by the Federal Assembly upon the advice of the Federal Council, and the risks are borne by the people collectively in so far as they are not shifted to those portions of the community that desire the creation of new facilities. In fact this shifting of risk to the consumer is a recognized practice in public business administration in Switzerland, and the cantonal and municipal authorities assume readily their share of the burden. Thus the structure of Swiss public business enterprise resembles an arch, of which the people themselves in their double capacity of producers and consumers are the foundations, and of which the keystone is the Federal Council, that unique body of trained administrators, consecrated to the service of their country and rewarded by the life long esteem of their fellow citizens.

The organization of the telephone business in Switzerland suggests a comparison with that in Germany. In most respects, the structure is the same. In both countries, the risks are taken and

¹ *Botschaft des Bundesrates an die Bundesversammlung betreffend die Vereinigung von Post- und Telegraphenverwaltungen (vom 25. Feb., 1907). Bundesblatt, 1907, i, 799.*

the rates are made¹ by the legislative branch of the government. The actual administration is intrusted to permanent officials, acting under the supervision of the executive authority, likewise enjoying security of tenure of office during good behavior, and assisted in the work of adjusting supply to demand by the active collaboration of the consumers themselves. In Germany, the latter are represented by their quasi-public economic organizations; in Switzerland the local political organs of government are also enlisted in the work. In both countries, the division of responsibility for the good conduct of the telephone business in accordance with the division of interest in its good conduct has produced an efficient system of public business administration. The striking difference between the two organizations is one of spirit. The German system is essentially autocratic; or perhaps it might better be described as benevolently despotic. The Swiss system is thoroughly democratic. The partnership between the administration and the public is founded on perfect frankness between the partners and mutual confidence. It is probably safe to assert that both organizations are highly efficient, but in the case of Germany we can only surmise it, whereas in that of Switzerland we know it.

In competitive businesses the professional risks are so great that the prospect of a profit is necessary in order that these businesses may be carried on at all. In such a governmental business undertaking as the Swiss telephones, the risks are abolished by the exclusion of competitors and the organization of the market. The proprietors of the undertaking, however, do not sacrifice their prospects of profit. The Swiss people take their profit in the form of a cheaper and more widely extended service than it is possible to conceive under any form of private ownership.

¹ It is at least practically the case in Germany, although legally the Reichstag has a voice in rate-making only in case the rates are raised.

CHAPTER XIV

THE LABOR SITUATION IN THE SWISS TELEPHONE SERVICE

IN Switzerland there has not been such a concentration of capital and of labor as has marked the development of the factory system among her more powerful neighbors. There are not the same extremes of wealth and poverty. A larger proportion of the Swiss population are independent farmers or handicraftsmen, and class barriers are less in evidence than in such a country as Germany. Both the large factory and the large body of wage-earners, dependent upon a single employer, are rare in Switzerland. Hence the economic foundation for a special wage-earners' movement is weak.

If the two forms of expression of a working-class consciousness, trade-unionism and socialism, are found as highly developed in Switzerland as in Germany, the explanation must be sought less in the strength of the factors tending to promote such a movement than in the weakness of those tending to oppose it. In fact, neither form of expression is as strong in Switzerland as in Germany. In the Swiss section of the International Trade-union report for the year 1906 we read that despite the greatest efforts on the part of the national secretary, he was unable to secure statistics indicating the actual membership of the Swiss trade-unions.¹ The conclusion that must be drawn from this is that the local unions, or at least many of them, were too weak to support their national leaders properly.² The political expression of a distinct working-class consciousness was scarcely stronger. The number of socialist votes cast at the elections to the National Council in 1905 was a round 70,000, less than a tenth of the electorate.³ This was a marked ad-

¹ *Vierter Internationaler Bericht über die Gewerkschaftsbewegung*, 1906. Berlin, 1908, p. 127.

² Sombart (*Sozialismus und soziale Bewegung*, 6th ed., p. 309) estimates the number of trade-unionists in 1907 at about 50,000 in the Allgemeiner Gewerkschaftsbund, and about 30,000 in independent local organizations.

³ Cf. Sombart, pp. 307-308.

vance over the strength of the party at its début in 1888. Yet compared with the socialist movement in Germany, Swiss socialism is still in its infancy.

There are practically no obstacles to the growth of an independent working-class movement in Switzerland outside of public opinion. The laws of association offer no restrictions to the formation of political or economic unions of any sort, whether by workmen in private employment or by those in the employ of the state. Public opinion, however, constitutes a serious obstacle. This is not because the Swiss as a race are consciously antagonistic to socialism or to trade-unionism. Most Swiss are probably indifferent to both, although the spirit of class consciousness behind an independent workingmen's movement is unquestionably repulsive to the Swiss ideals of democratic individualism and the subordination of special interests to the welfare of the whole community. The Swiss community is homogeneous, despite the differences of race and language; hence the spirit of class cannot meet with general favor. But the principal cause of the resistance offered by public opinion in Switzerland to socialism and trade-unionism lies in the fact that the Swiss people are always ready to listen to suggestions for social reforms, and they are generally prompt to act upon them. Their system of the initiative and the referendum gives every Swiss an opportunity to lay his proposals before the people and to secure their adoption into law in case of approval by the people. The result is that all measures of social reform can be considered upon their merits under the existing institutions. This circumstance tends to cut the ground from beneath the feet of the advocates of a social revolution. Socialism in Switzerland, in order to make any headway, must adopt a more opportunist policy than in Germany. At the same time the parties in power in Switzerland are inclined to adopt a much more radical policy than their German prototypes.

This tendency manifests itself, so far as concerns the relations between the state employer and the public servants, in the creation of such generous conditions of employment that there is no incentive to independent action on the part of the great majority of the latter. The wages and general conditions of employment

for officials in the telephone service, as in other branches of the postal and telegraph department, were originally regulated by the general salaries act of 1873. This act classified all federal officials, with the exception of skilled workmen employed in the federal shops and construction works and of casual and unskilled laborers, provided for security of tenure, and arranged the conditions of promotion. It was amended at various times during the next twenty years and then superseded in 1896 by a new general salaries act. The new act established maximum and minimum rates in each class and provided for an automatic increase of salaries by a fixed amount every three years until the maximum should be reached. The act was devised to readjust the official salaries to the altered conditions of life that had come about in the generation since the passage of the former act. There is no evidence that the public employees exercised any undue influence upon the Federal Assembly, which ordered the preparation of the new classification and schedules of wages, or upon the Federal Council, which was intrusted with the task of making the revision.

The first special movement to affect the conditions of employment of the telegraph and telephone employees was made in 1891. In the previous year an act had been passed regulating the hours of labor and days of rest of employees in all transportation undertakings (railways, lake and river navigation, street railways, and the postal service), but not in the telegraph and telephone service. Among other provisions the law of 1890 prescribed 52 holidays in each year. In the following year a petition was sent to the Federal Assembly, praying that the benefits of the law of 1890 be extended to the telegraph and telephone service. The Federal Council replied to the petition in a message to the Assembly,¹ showing that the telegraph and telephone employees already enjoyed conditions of employment as good as those prescribed by the law of 1890. If they did not have fifty-two holidays a year, as that law prescribed, they had a shorter day than the law required, and enjoyed, besides an annual vacation of fifteen consecutive days,

¹ *Botschaft des Bundesrats an die Bundesversammlung, betreffend die Ruhelage der Beamten und Angestellten der Telegraphen- und Telephonverwaltung vom 4. Dez. 1891. Bundesblatt, 1891, v, 581 ff.*

other days of rest on Sundays and holidays sufficient to make the total number of days of rest during the year from forty-two to forty-four, according to circumstances. The Council accordingly recommended that the petition be not granted. The Federal Assembly nevertheless adopted the view of the petitioners, and extended the application of the law of 1890 as desired. It is important to add that the petition did not originate among the telegraph and telephone employees, but came from the Society for the Promotion of the Observance of the Sabbath.

The next attempt to alter the conditions of employment of the telegraph and telephone service came from a different quarter. At this time the working-class consciousness was just awakening in Switzerland. The use of the initiative in federal affairs was sanctioned by the people in 1891, and the radical reformers and socialists were not long in taking advantage of the new institution in order to test the state of popular feeling with regard to the problems created by the growth of the wage-earning class. In 1894 a proposal to establish by law the right to work, that is, the right of every citizen to demand from the state the opportunity to earn a decent livelihood, was submitted to the popular referendum on the initiative of several thousand more than the requisite fifty thousand voters. At the referendum, however, the proposal was defeated by the heaviest majority ever cast at a Swiss federal referendum. There were 75,880 citizens who voted in favor of the proposal and 308,269 against it, or a majority of more than four to one. This failure to establish the principle of the right to work did not discourage the leaders of the budding working-class movement. It simply diverted the direction of their energies from the field of politics to that of trade-unionism.

In several of the largest Swiss cities at about this time, central labor-unions were formed for the purpose of coördinating the work of the various local unions then just struggling to their feet, and especially in order to maintain a permanent salaried secretary. His function was to direct the common activities of the local unions and in general to promote the interests of the wage-earning class. In Berne, the capital of the Confederacy, the first labor-secretary was a Russian refugee, Dr. Wassilieff by name, a man of consider-

able organizing ability and of tremendous enthusiasm for the cause which he was paid to promote.

He immediately set to work to stir up the laborers within his sphere of influence to demand the improvement of their conditions of employment. He devoted his especial attention to the laborers employed by the city and by the federal government.¹ He caused the laborers employed in the federal military workshops to elect commissions for the purpose of framing a list of grievances. The union of telegraph and telephone laborers did likewise. In December, 1896, the latter sent in a petition to the federal telegraph department praying for a radical revision of their conditions of employment. At about the same time the commissions elected by the other federal laborers sent in a petition to the Federal Council, containing their desires with respect to the amelioration of their conditions of employment.

The petition of the telegraph and telephone laborers requested that they be employed on the same principles as were established for the higher officials and various grades of clerks by the salaries act of 1896, and that their union be officially recognized by the department as the representative of its laborers. The other petition was more precise in its prayer, and bore testimony to the guidance of the master-hand of Wassilieff. Its most characteristic features were the following:—

(1) Days of rest: every Sunday and legal holiday plus fourteen consecutive days for vacation and the first of May (the day proclaimed as Labor Day by the International Workingmen's Congress at Paris in 1889);

(2) The eight-hour day;

(3) Overtime to be paid at the rate of 25 % more than the normal wage by day, 50 % more by night, and 100 % more on Sunday;

(4) Laborers employed continuously for more than two years to receive permanent positions with annual salaries;

(5) Increase of salary every third year until the maximum should be attained;

(6) Continuation of pay during illness;

¹ Wassilieff: *Die Lohn- und Anstellungs-Verhältnisse der eidgenössischen Arbeiter*, 1896.

(7) A retiring allowance of four fifths of latest salary in case of disability after fifteen years' service;

(8) A minimum wage (in case of laborers employed more than two years, a minimum salary) for both skilled and unskilled laborers;

(9) Equal pay for both men and women; and

(10) Election of foremen by the wage-earners.

Such sweeping demands might well have staggered less generous employers than the Swiss federal government. The latter, however, coolly pigeonholed the two petitions and waited for the flurry to blow over. But they reckoned without their host. There was a socialist in the Federal Assembly as well as in the labor secretary's office at Berne. Under the conditions that prevail in the Swiss Federal Assembly he had no difficulty in securing the assent of a majority to a postulate, requesting the Federal Council to investigate and report concerning the conditions of employment of the federal laborers. When the Federal Council wrote to the author of the postulate, asking him what he wished it to report about, he referred it to the two petitions and to Dr. Wassilieff's pamphlet on the subject. Then the Federal Council prepared a full statement of its position.¹

This statement repudiated absolutely the principle that the state should be a model employer. On the contrary it declared that the state should accept the standard of employment established by the best private employers. To do more than that would simply be to favor one class of workingmen at the expense of others and to create a spirit of discontent among these others which would be injurious both to themselves and to private business generally. The Federal Council pointed out that those of its employees who were employed in factories or workshops already enjoyed the benefits of the federal factory acts, and that the others were for the most part casual laborers who could not well be granted the same conditions of employment as were enjoyed by the higher

¹ *Botschaft des Bundesrats an die Bundesversammlung betreffend das Postulat Wullschlegler (Lohn- und Anstellungs-Verhältnisse der im Dienst der Bundesverwaltung stehenden Arbeiter) vom 15. Okt. 1897.* (Dated April 28, 1899.) *Bundesblatt*, 1899, ii, 621-687.

officials and clerks. Security of tenure, it asserted, for manual laborers was incompatible with satisfactory diligence at work. The requests that the number of apprentices in the workshops be limited in accordance with a rule which was set forth in the petition and that the workmen be allowed to choose their own foremen were dismissed on the ground that such proceedings were irreconcilable with efficient production and the good conduct of affairs. The demand for official recognition of the telegraph and telephone laborers' union and of the commissions elected at Wassilieff's instigation by the workmen in the shops was declared to be incomprehensible. The workmen were free to organize as they saw fit, and the managements were free to deal with the officials of the unions and the elected commissioners as representatives of all or of a part of the workmen in their respective establishments according to the nature of their mandates. Nothing more, in the opinion of the Federal Council, was required. There was no complaint that the various managements had dealt arbitrarily with the organizations of their laborers, and the Federal Council refused to take away their liberty to deal with their laborers at their own discretion.

The Federal Council declined to accept the principle of a minimum wage on the ground that it would prevent the remuneration of laborers according to their efficiency and would cause the discharge of many laborers not capable of earning the minimum as fixed by the petitioners. Periodic increases of wages also were rejected as repugnant to the principle of remuneration according to efficiency. The proposals in regard to pensions in case of illness or disability would be considered in connection with the general workingmen's insurance bill then being prepared.¹ Finally, the reduction of the hours of labor from ten or eleven to eight was too abrupt. The reduction of the hours of labor, the Federal Council declared, must be made more gradually, lest the result be a diminution of the daily output and a loss instead of a gain to the community of which the laborers themselves formed a part. In general the federal government took the position that the federal business undertakings must be managed on strictly business prin-

¹ This bill was rejected by the people at a referendum in the following year.

ciples. The federal employees should be treated as well as the best, but no better. The state employer should follow, not lead, the private employer.

Such was the position of the Federal Council in 1899. This declaration of principle was accepted by the Federal Assembly without discussion and by the federal laborers without protest. Dr. Wassilieff had left Berne, and the labor organizations were shrewd enough to recognize that their position could not be improved by any but opportunist tactics. There is no record of another such doctrinaire expression of their collective will with regard to their conditions of employment. They had found that their state employer was personified in the shape of reasonable beings ready to listen to their grievances and to give reasons for refusing a remedy when refusal was deemed necessary. Thereafter the unions of laborers in the employ of the state pushed their claims to a revision of their conditions of employment in a more businesslike manner. They abandoned many of the more extravagant demands of 1896, and concentrated their attention on the main issue of security of tenure and a minimum wage.

In 1909, just ten years after the rejection of the Wassilieff proposals, the federal telegraph department, in response to a petition from the union of telegraph and telephone laborers, granted the minimum wage and security of tenure. The administration did not explain why it had abandoned the principles laid down in the message of 1899. Yet by granting the petition of the laborers' union in 1909, it had accepted the principle that the state should be a model employer. Certainly one reason for the change of opinion on the part of the telegraph authorities was the change of tactics on the part of the laborers. The tactful petition of 1909 bore little resemblance to the impracticable manifesto of 1896. During the interval also the business undertakings of the federal authorities had greatly increased in magnitude. With the acquisition of the railways came the necessity of a more careful study of the modern labor problem. The abandonment of the theoretical position of 1899 shows an appreciation of the main fact of that problem. In practice, even at the time of the Wassilieff petitions, the laborers in the telegraph department, although not those in the military

department, enjoyed more liberal conditions of employment than laborers similarly employed by private employers.¹

Another instance of the greater recognition obtained by the employees' association, in recent years, is afforded by their negotiations with the Federal Council to secure an increase of their wages to correspond to the increased cost of living that set in with the dawn of the new century. By 1906 the higher cost of living had become so marked that the unions of federal employees began to press their claims to an increase of pay. The Federal Council recognized the justice of their claims, but wished to postpone the revision of wages until a general act could be prepared that would apply to all the federal employees. But the laborers and lower grades of clerks could not wait for a general act. In December, 1906, the Union of Postal, Telegraph, and Customs Officials, the Union of Swiss Transportation Laborers and the Union of Swiss Transportation Officials simultaneously petitioned the Federal Assembly for a special supplement to their regular wage during the year sufficient to compensate for the increase in the cost of living. The petitioners supported their prayer by tables showing the rise in price of the leading necessities of life since 1898.²

The lower house of the Federal Assembly accepted the suggestion of the petitioners, and recommended that a supplement of 10% of the regular wage be given to all married employees earning less than 2500 francs a year. Before the upper house could act in the premises the Federal Council receded from its earlier position and announced that it would make a proposal for a temporary supplement to the normal wages without waiting for the contemplated revision of the general salaries act. The employees also were dissatisfied with the nature of the supplement proposed by the lower house and brought their influence to bear against the acceptance of the latter's proposal. The Federal Council then made

¹ Cf. Message of the Federal Council concerning the contract system in the construction of telegraph and telephone works, cited below.

² *Botschaft des Bundesrats an die Bundesversammlung betreffend die Bewilligung eines Spezialkredites behufs Ausrichtung von Teuerungszulagen für das Jahr 1906 an die eidg. Beamten und Angestellten . . . (vom 2. April, 1907)*. Bundesblatt, 1907, ii, 955 ff. Cf. *Schweizerisches Zentralblatt für Staats- und Gemeindeverwaltung*, vii, 217 ff. and viii, 84 ff.

a careful investigation and eventually recommended that each married employee or unmarried employee with persons dependent upon him for support and earning less than 4000 francs a year should receive an addition to his annual salary of 100 francs a year, and that all other employees earning less than 4000 francs a year should receive 50 francs. This proposal was accepted with a slight modification by the Federal Assembly. The Federal Council took pains in its message to the Assembly to remark on the courteous tone of the employees' petitions and the reasonableness of their request.

The incident in itself is not perhaps of great importance, but illustrates very well the good understanding that prevails between the governing bodies and their employees. The influence which the latter exert in order to bring about an improvement of their conditions of employment has no unhealthy influence on Swiss politics; it is not so strong as to subordinate the good of the service to their private advantage; and yet it is strong enough to secure the recognition of their just claims.

The Swiss employees have by no means obtained all their desires. They wish legal provision for accident insurance, but that will not be granted until a general system of workmen's accident insurance is adopted for the whole republic. They wish the legal establishment of elective boards to represent them in all administrative matters affecting their interest, but while the representation by means of the voluntary unions works so well, the government is slow to recognize the necessity for a more comprehensive representation. As things now stand, in Switzerland more than in any other country on the Continent of Europe, organized public employees are admitted to a share in the determination of the conditions of employment, and the collective will of the wage-earners is recognized as a valuable force making for the good conduct of public business undertakings.

In the year 1905, when the Federal Assembly was considering the telegraph and telephone budget for 1906, the lower house requested the Federal Council to investigate and report whether or not telegraph and telephone works would be constructed more cheaply and more quickly if the work were done under contract

instead of directly by the government. The mover of the request pointed to the fact (which no one contested) that the federal laborers were better paid and enjoyed better terms of employment generally than did the laborers employed by private contractors, and contended that the policy was a costly one for the government.

The Federal Council took pains to reply to this postulate candidly and completely in a special message.¹ It admitted that the first cost of the work done by the telegraph and telephone laborers was greater than that done under contract, partly because the government paid its laborers more and partly because it could not drive them as the private contractors could and usually did. It asserted, however, that this higher first cost made for economy in the long run, because government work was more substantially executed than contract work, and consequently both gave better service and endured longer. In order to secure equally satisfactory results under the contract system, the savings in the cost of labor would be more than consumed in the extra expense of inspection during the execution of the work and of maintenance afterwards. Hence, apart from the fact that the piecemeal and scattered character of much telegraph and telephone construction and repair work did not lend itself to the contract system, the cheaper contract labor would prove in the long run the more costly. The contractor made his profit by the employment of large masses of cheap labor for each separate undertaking. He finished his contract as soon as possible, and then dismissed his laborers until another contract should be secured. The telegraph administration so arranged its work as to give continuous employment to a smaller number of laborers and paid to them in wages what the contractor put in his own pocket. The pursuance of this policy in moderation, the message concluded, stimulated an improvement in the condition of the laboring-classes generally, and justified itself not only by the increased well-being of that portion of the community, but also by the increased efficiency which resulted from the gradual improvement of the standard of living.

¹ *Botschaft des Bundesrats an die Bundesversammlung betreffend Übertragung der Telegraphen- und Telephonlinien bauten an die Privatindustrie* (vom 13. März, 1906). Bundesblatt, 1906, ii, 334 ff.

This message marked the official acceptance of the policy that the state should be a model employer of unskilled as of other grades of labor. The granting of the petition of 1909 was the next stage in the development of that policy. What the further steps will be remains yet to be seen.

PART III

PUBLIC OWNERSHIP OF TELEPHONES IN FRANCE

CHAPTER XV

PRIVATE OWNERSHIP OF TELEPHONES IN FRANCE

OUTSIDE of Germany and Switzerland, no European telegraph administration was willing to take upon its own shoulders the task of building up a telephone business. All with one accord declined to assume the initial risks, preferring to turn over to private enterprise the responsibility for the adjustment of the new means of communication to its proper place in business and social life. In France, Belgium, the Netherlands, Austria, Hungary, Italy, Norway, Sweden, Denmark, and Spain, and in Europe generally, the telephone was consequently introduced not by the public authorities but by private promoters.

This almost universal reluctance to undertake the new venture requires some explanation. To dismiss the subject with the terse observation that the diffidence of the public telegraph authorities was caused by their lack of enterprise is unjust to them. It is unquestionably true that the telegraph authorities of Europe generally were not so enterprising as the energetic and acute head of the German telegraph system. Yet we cannot hope to explain the whole telephone history of Europe on the "great man" theory. Though the telephone was everywhere recognized as a part of the public telegraph monopoly, it does not follow that on this account the telegraph authorities were themselves bound to undertake the task of experimenting with the new invention. The telegraph administrators who chose another method of introducing the telephone into their respective countries did not act wholly without reason.

The alternative policy of intrusting the work of preliminary experimentation to private enterprise has certain advantages. It enables the public authorities to avoid the risk of sinking the public money in unsuccessful investments. At the same time, in case the undertaking turns out well, they can take the service back into their own hands by paying the private speculator a reasonable

recompense for his service in relieving the public of the risk of failure. This policy, however, requires for its successful application a mutual understanding between private speculator and public administrator, that the policy is only temporary, and at the termination of the experiment the former, in case of success, is to receive a liberal reward. Otherwise the public authorities may find difficulty in resuming the service, when it becomes desirable to do so, or the success of the experiment may be grievously impaired by the necessity under which the speculator finds himself of recouping his initial expenditures from the consumers before the termination of his uncertain period of operation. Provided these dangers are anticipated, it is perfectly legitimate for the public authorities to call in the aid of private enterprise in order to undertake initial risks.

The refusal of the public telegraph authorities outside of Germany and Switzerland to assume the initial risks of introducing the telephone implies the choice of this alternative policy of calling in the aid of private enterprise, for it was impossible for the public authorities to ignore the telephone altogether. Some of the arrangements made with private speculators showed a greater regard for the public interests than others, some were destined to give greater satisfaction and endure longer than others, but the outcome in all cases was the same.

As the first example of the general case the experience of France will be described. The employment of private enterprise to carry out the purposes of the public authorities was traditional in France. It was the policy adopted towards the railroads at the time of their introduction. It was the policy favored by the third Napoleon when he undertook the reorganization of the lighting and transportation services of Paris. It was a policy well adapted to the conditions of France because the centralized organization of the state and the stringency of its administrative system made public regulation easy.

The first appearance of the telephone in France was at the World's Fair of 1878 held at Paris. Scientific men regarded it as a curious mechanical toy; business men regarded it as an impracticable Yankee contrivance; and the public telegraph authorities simply

failed to display Stephan's quick grasp of its possibilities.¹ There the matter rested for a year.

In 1879 the telegraph authorities were forced to take an interest in Bell's astonishing invention. Representatives of the various telephone manufacturers in America arrived in Paris for the purpose of creating a market for their rival products. The obvious way to do this was to establish exchange systems on the plan of those first constructed in the United States in the preceding year. But in order to do so the consent of the telegraph authorities was indispensable. In 1837, after the episode of the private optical telegraph company, the French government had secured its telegraph monopoly for all time by the law of May 2. This law expressly forbade the transmission of signals from one place to another, whether by telegraph instruments or otherwise, without authorization. After electrical telegraphy had supplanted optical, this law was confirmed by a decree of Louis Napoleon dated December 27, 1851, and the decree was given the force of law along with the rest of his decrees issued after the *Coup d'État* by the Constitution of January 14, 1852. There was no doubt in 1879 that the telephone could not be introduced into France without the knowledge and the consent of the telegraph authorities.

Still the official engineers remained sceptical over the future of the telephone.² The minister in charge of the postal and telegraph service consequently did not feel justified in asking Parliament to sanction the investment of public money in such an uncertain undertaking. He decided to accede to the suggestions of the

¹ Concerning the early history of the telephone in France, there are two good contemporary accounts, one written from the standpoint of an opponent of public ownership, the other by a leading advocate of that policy:—

(1) Rousseau: *Mémoire sur la question si l'exploitation des téléphones doit être faite par l'état ou laissée à l'industrie privée*. Paris, 1882. Cited as Rousseau.

(2) *Rapport de M. G. Cochery sur la loi concernant l'établissement des réseaux téléphoniques d'intérêt local et le rachat des réseaux de la Société générale des téléphones*. Docs. parl., Chambre des députés, annexe no. 3765. Session ordinaire, 1889. Cited as Cochery Rapport.

Cf. also, Roger Lacombrade: *La construction et exploitation des lignes téléphoniques en France*. Paris, 1903. Cited as Lacombrade.

P. Pradelle: *Le service des postes, télégraphes, et téléphones en France*. Paris, 1903.

² Lacombrade, p. 40.

American promoters, and intrusted the task of introducing the telephone to private enterprise. On June 26, 1879, he issued a *cahier des charges* or model franchise, indicating the conditions on which exchange systems might be established.¹ Operation was restricted to cities approved by the telegraph authorities, and it was stipulated that all construction should be performed by state engineers under guarantee by the concessionnaires of full compensation for the actual expenses incurred. The concessionnaires were forced to accept the declaration of the telegraph department as to the amount of such expenses. No monopoly was granted, and the concession was good only for five years, at the end of which period the government was free to make any new arrangement it saw fit. If it decided to engage in the telephone business on its own account, it reserved the right to purchase telephone instruments from the concessionnaires at a price to be fixed by agreement, or, in default of agreement, by arbitration, but without any compensation for patent rights. Finally, the concessionnaires were obliged to pay a royalty of ten per cent of their gross receipts.

Such was the first European telephone franchise. The conditions could not be regarded as favorable to the growth of the telephone industry. The restriction of the franchise to five years without any definite provision for further prolongation, or for purchase at the end of that period, and the absence of any protection against competition, either between different private companies or on the part of the state itself, increased enormously the uncertainties of the infant industry. That the concessionnaires thus had every incentive to mulct the public while the opportunity lasted is perfectly obvious, and must have been realized at the time by the telegraph authorities themselves. Yet they reserved no adequate control over rates. Their whole attitude seemed to have been dictated by the one purpose to evade the risk of introducing the new service by shifting the responsibility to private promoters. At the same time they protected themselves against unexpected success by making the term of the franchise short. Consequently, in order that private enterprise might be induced to undertake the risk at all, it had to be allowed liberty to recoup its advances

¹ Cochery Rapport, pp. 20-27.

quickly from the consumers. The *cahier des charges* of 1879 assured the safety of the governmental telegraphs, at least for a while, and in the meantime left the public and the concessionnaires to get along as best they could. The only explanation of this policy is that the telegraph authorities expected the public to be amply protected by the growth of a lively competition. Nevertheless, they can scarcely be excused for their failure to make definite provision, either for the later resumption of the business on fair terms or, if deemed expedient, for continuance of the business under private management, subject to public regulation in the interests of the community. If the telephone should eventually prove to be an undertaking that ought to be managed as a part of the public telegraph service, the later resumption of the industry was certain to cause trouble.

At first it seemed that the expectation of a lively competition was to be realized. During the course of the summer of 1879, three separate undertakings were authorized.¹ The Gower, Blake-Bell, and Edison systems received special concessions in the order named. The first and last were entitled to establish exchange systems in Paris, Lyons, Marseilles, Bordeaux, Lille, and Nantes. The Blake-Bell concession was good for Paris only. The prospects for a period of lively competition might well have been considered bright, yet before any work was actually begun these prospects were dispelled. The concessions were transferred from one promoter to another, until on December 10, 1880, all found their way into the hands of a single company known as the *Société générale des téléphones*.

This process of amalgamation was initiated by the rival promoters themselves, who quickly realized that if their concessions were to be of any profit to them they must not squander their five years' lease of life in the telephone business by trying to cut one another's throats. The process was accelerated and brought to an early conclusion by the refusal of the municipal authorities of Paris to allow the use of the public ways for carrying telephone lines until the fusion was accomplished. The ground of this refusal was that much unnecessary damage to public property would re-

¹ Rousseau, pp. 1-2.

sult in digging three conduit trenches in the pavement, or three post holes in the sidewalk, where one would do as well.¹ The result of this refusal was to prevent the growth of competition anywhere in France.

The first exchanges in Paris were opened in the early part of 1881,² at the same time that Stephan was opening his first exchange in Berlin and the Swiss their first exchanges in Basel and Berne. The rate in Paris was fixed at 600 francs and elsewhere at 400 francs. The first German rate was 200 marks and was reduced in 1884 to 150 marks. The early Swiss rate was 150 francs. The French public were certainly paying a heavy price in order that their telegraph authorities might employ the aid of private enterprise in undertaking the initial risks of establishing the telephone business.

The public authorities were not slow to perceive this. Yet they could not make up their minds what was the proper course for them to pursue. The latest of the three concessions owned by the *Société générale des téléphones* would expire on September 8, 1884. The telegraph authorities were not yet convinced that the telephone service ought to be administered in conjunction with the telegraphs. Yet it was already apparent to them that the telephone was a business with a future before it. In order to gain experience in the conduct of telephone operations, they proposed in 1882 that the government itself should tentatively establish exchanges in a few places.³

There was also another reason for their engaging in the business at that time. The telephone company had already established exchanges in only half a score of the largest cities in France and showed no disposition to extend the service to the medium-sized places, to say nothing of the smaller cities. This was just what might have been expected to be the result of restricting the franchise to so short a period as five years. The company simply skimmed the cream. The telegraph authorities tardily awoke to the realization that they had a duty to perform towards medium-sized cities.⁴

The proposal of 1882 at once raised the general question of the

¹ Cochery Rapport, p. 9.

² Lacombrade, p. 49.

³ Rousseau, p. 8.

⁴ Cochery Rapport, p. 10.

advisability of the state's engaging in such a commercial undertaking as the telephones. This question had never arisen in connection with the telegraphs, because they were not undertaken as a commercial venture. The whole subject had, however, been threshed over several times in connection with the railroads, and only within a few years the French had reluctantly yielded to supposed necessity and decided, rather against their general inclination, to enter upon a policy of state railroad construction and operation. The telephone question was relatively a trivial matter and attracted comparatively little attention. There was some protest that the telephone company was being deprived of the fruits of its early labors.¹ The telephone company, however, could count on little popular sympathy. It was already making the most of its fleeting opportunity, and could not justly complain if the state chose to carry the business into places into which the company did not care to go. That did not diminish its expectation of profit before 1884, and after that date it had no claim to carry on the business at all.

There was a more general disinclination to see the government engage in the telephone business on broader grounds of public policy. The *laissez faire* school of political economy was then influential in France, and was consistently opposed to governmental ownership of telephones. But the great mass of the people were not interested in the telephone. At that time it was used only by bankers and brokers, large manufacturers and wholesale merchants in Paris and a small number of the largest cities in the departments. Public opinion was willing to leave the telegraph authorities to deal with the telephone in any way they saw fit, provided they did not put a financial burden on the public treasury. Parliament voted the desired appropriation of a quarter of a million francs in July, 1882, and work was immediately begun.²

The subsequent history of private telephones in France is related in Cochery's report of 1889. His account of the facts is absolutely trustworthy, whatever differences of opinion may arise in regard to his conclusions.

The government opened exchanges at Rheims, Roubaix, and

¹ Rousseau, pp. 4-6.

² Lacombrade, p. 75.

Tourcoing, April 1, 1883, and during the next two or three years in a few other cities of commercial importance. When the time arrived, however, for a new decision concerning the ultimate disposition to be made of the telephone industry, the government was still unable to adopt a definite policy. It was not yet prepared to take the entire business into its own hands, and it was equally unwilling to turn it over to private enterprise without reserving the power to protect the public telegraphs. There was nothing left to do but to prolong for another term of five years the existing temporary arrangement. The policy of drifting had at least the advantage of assuring the government its ten per cent of the gross receipts from private telephone operations.

The minister in charge of the telegraphs was reluctant to assume the entire responsibility for this policy. He introduced a bill into Parliament June 21, 1884, to sanction his decision, or rather indecision, but the special committee appointed to consider the bill reported that legislation was unnecessary because the proposed *cahier des charges* was simply an extension of the former one, granting no monopoly and putting no financial burden on the government. Parliament accordingly declined to accept any responsibility in the premises, and did not even appropriate funds in order that the telegraph authorities might extend the works which they had already undertaken.¹

The minister in charge of the telegraph service had promised in introducing his bill to continue his new policy of establishing exchanges at the same time that he prolonged the concession of the *Société générale*. However, he could not do much without appropriations. Moreover, in 1885, the progress of telephony made it impossible to defer longer the construction of long-distance lines. Such construction was beyond the power of the company without special authorization. The telegraph authorities were therefore obliged either to undertake it themselves or to require the company to do it for them. They were decidedly averse to inviting the company to relieve them of this task, because long-distance lines would come into direct competition with the public telegraphs. Accordingly they were willing for once to undertake

¹ Cochery Rapport, pp. 15-17.

the risk themselves. This construction consumed what little spare capital the department had at its disposal, and prevented the expansion of the local service from being pushed with even the vigor that might otherwise have characterized that branch of the service. The telegraph authorities suspended the construction of new exchanges after the beginning of the year 1887, and the company established but one after 1883.¹

In 1888 there were only twenty-seven exchanges in all France, of which twelve had been established by the *Société générale*. One of these, that at Lille, was sold to the state in 1885 in order to complete its local territorial telephone system, which included Roubaix, Tourcoing, and the vicinity. Only three of the company's exchanges were established in cities of less than 100,000 inhabitants. In 1888 6120 out of its 8459 subscribers were in Paris alone. In the same year the government was operating exchanges in sixteen places. Only six of these were places of under 40,000 inhabitants. The total number of subscribers to governmental exchanges was only 2288. The development proportionately to the population of the places served was slightly greater in the exchange systems of the state than in those of the company.

In 1885 the government began the construction of long-distance lines between Paris and the provincial cities which were provided with exchanges. The most important of the long-distance lines was that to Marseilles by way of Lyons. This was finished in the summer of 1888, and was over five hundred miles in length. One international line, that to Brussels, had also been constructed. This line, about two hundred miles long, was opened in February, 1887. The immediate result was a marked falling off in the number of telegraphic communications between the two places, and the receipts from telegraph fees consequently showed a great decline.² In the case of the traffic with Brussels, the losses on the telegraphs were more than compensated for by the receipts from the long-dis-

¹ Cochery Rapport, pp. 46 ff.

² Cochery Rapport, p. 71. For the effect of the construction of long-distance telephone lines on the traffic over parallel telegraph lines, cf.: *Rapport de M. Belugou à la commission consultative des postes et télégraphes*, 1887, p. 22; and the *Rapport de M. Ungérer à la même*, 1888. Cited by Lacombrade, p. 38. The decline was marked in some small countries, such as Belgium, the Netherlands, and Switzerland.

tance telephone. But there was no certainty that this would be the result everywhere. The use of the long-distance telephone might in many cases even supplant altogether that of the telegraph. Thus the effect of the further extension of long-distance telephony might be to render useless a vast amount of valuable plant. In order to protect itself against this contingency, the department experimented with a device invented by a Belgian telegraph engineer, van Rysselberghe, intended to make possible the simultaneous use of the telegraph wire for both telegraphy and telephony. The system did not prove a success. Successful telephony over considerable distances required the use of a special wire made of bronze or other expensive material. The simple iron telegraph wire would not serve the purpose. Thus the telegraph administration saw itself threatened with serious losses from the not improbable growth of the telephone at the expense of the telegraph.

No human eye could foresee the future development of the telephone industry. The progress of electrical engineering in the preceding decade had been bewildering. The electric arc and incandescent lights, the electric street railway, were unknown ten years before. When telephone exchanges were first established, the use of the instrument over distances of more than a score or two of miles was wholly impracticable. But if messages were already being sent by long-distance telephone over hundreds of miles, what might not the immediate future have in store? Nothing was impossible.

The decade of skepticism and indecision in the French telegraph administration was terminated by a sharp spasm of alarm. It was then seen what a mistake it would have been to have allowed the telephone industry to have escaped altogether from the control of the telegraph authorities. Those countries which at the beginning had introduced the telephone into the public telegraph system were now able to control the development of the industry and prevent an excessively rapid depreciation of the public investment in the telegraphs. The French telegraph authorities at the beginning had been cautious. They had not undertaken to introduce the telephone themselves, but they had so limited their concessions that now they could quickly get complete control of

the industry back into their own hands. And they resolved to do it.

Cochery in his report of 1889 states the reasons which were meant to convince Parliament of the wisdom of the decision made by the telegraph authorities.¹ Under the existing arrangement, it was pointed out, there was no adequate protection for the public against the exaction of unreasonable rates by the company. Moreover the company had made such good use of its prolonged lease of life in order to recoup its original expenditure, that it would now be impossible for any private competitor to make head against it. In the commanding position in which it had intrenched itself it was impregnable to all ordinary attacks.

But this was no answer to the objection that a new contract could be made with the company by virtue of which the public authorities could assure to the company security of tenure for a definite period, with a predetermined status at the end of that period, and in return demand some concessions in the interest of the community at large. In fact, such a contract had already been proposed.² On January 18, 1887, M. Granet, who was then the minister in charge of the telegraph service, introduced a bill into Parliament to give the sanction of law to an agreement which he had drawn up with the telephone company November 25, 1886, by virtue of which precisely this object was to be obtained. The *Société générale* was to be transformed into the *Société fermière des téléphones*; that is, the monopoly of the telephone business was to be farmed out. The concession, which was nominally a lease, was to run thirty-five years. The government was to turn over to the company all its existing exchanges. At the end of the concession the entire plant operated by the company was to revert to the state without cost. Provision was made for the option of the repurchase by the state, according to specified terms, after fifteen years, but until that period had elapsed the company was to have an absolute monopoly. Rates were fixed by mutual agreement in advance at 400 francs for Paris and 300 francs for the departments.

¹ Cochery Rapport, pp. 105 ff.

² *Ibid.*, pp. 31-34. Cf. the debate in the Chamber of Deputies, July 9-10, 1889. *Journal Officiel*, Débats parl., Ch. des Dép., 1889.

Reductions were to be made when net profits to stockholders should exceed eight per cent. The company was to pay to the state as rental fifteen per cent of the net profits, to be ascertained by deducting from the gross receipts the operating expenses plus the payments towards a sinking fund for the capital invested, both bonds and stocks. Only on the surplus remaining after the stockholders had received six per cent dividends in addition to the sums set aside for amortization, should the fifteen per cent of the government be reckoned.

In support of his bill Granet ascribed the backward condition of the telephone business of France (which was undisputed) to the division of management between the company and the state. The company feared purchase in 1889, and hence would not establish new exchange systems, improve those already in existence, or reduce its rates. The government on its side did not want the company to establish new exchanges, for that would mean just so much more plant to be purchased at the expiration of its franchise. Nor could the government construct new works itself on account of the difficulty of securing appropriations from Parliament. Parliament was unwilling to appropriate the public money until it knew what the ultimate disposition of the plant was to be, and in fact had not appropriated anything for fresh construction since its first appropriation in 1882.¹

During the interval between the publication of the Granet plan and its discussion in Parliament, its author was replaced at the head of the postal and telegraph administration by M. Coulon. The latter was frankly hostile to the proposal of his predecessor. Public opinion was divided in everything except in impatience with the existing state of affairs. In a special report prepared by a leading business man in response to a request from the subscribers to the telephone system in Paris,² it was stated (1) that the telephone rates of the *Société générale* were excessive; (2) that those of the state were complicated and unsound in principle; ³ (3) that public

¹ Lacombrade, p. 67.

² *L'exploitation des téléphones*; rapport présenté à la Chambre syndicale des Industries diverses, séance du 28 février 1888, par M. Léon Ducret, président de la Chambre syndicale, etc. Paris, 1888. Part 3, Conclusions.

³ These rates will be discussed in a later chapter.

ownership had serious disadvantages; (4) that the Granet plan was undesirable in that it contemplated the establishment of one single monopoly over the whole country and was, moreover, a less favorable bargain from the standpoint of the government than might reasonably have been expected. The solution of the problem recommended in this report was the division of all France outside of Paris into half a dozen sections, in each of which the telephone monopoly should be farmed out, and the creation of a special company to manage the business in Paris. This proposal may have been suggested by the French treatment of the railroad problem, and also bears a close resemblance to the plan adopted in this same year (1888) for supplying Paris with electric light. It was in harmony with French methods of regulating monopolistic businesses. However, it possessed the fatal defect, from the point of view of the government, of not providing an adequate safeguard for the revenues from the public telegraphs.

In the sessions of 1887 and 1888, Parliament took no action in regard to the Granet proposal. In 1889 action of some sort was unavoidable. By that time also Parliament had become convinced of the strength of the second main argument brought forward in the Cochery report, viz., the expediency of preventing disastrous competition between the telephone and the public telegraphs.¹ No concession could provide for all possible contingencies in such a surprising business as the telephone.² The only certain means of protection was for the state itself to own the telephones. If the government should attempt to make its task lighter by keeping in its own hands only the long-distance lines, as was provided under the Granet plan, the separate management of the local exchange systems might be expected to lead to endless complications. The logical conclusion was that the government should at once regain complete control of the entire telephone industry.³ On March 19, 1889, the Chamber of Deputies rejected the Granet plan.

The *Société générale*, however, was not disposed to abandon its lucrative business without a struggle. No sooner was the agreement of November 25, 1886, rejected by Parliament than it pro-

¹ Cochery Rapport, p. 118.

² *Ibid.*, p. 120.

³ Cochery Rapport, p. 121.

duced an earlier secret agreement of a similar purport. This agreement was made between Minister Granet and the representatives of the *Société générale* on July 22, 1886. The latter declared that it did not require the sanction of Parliament and that they should regard it as valid and binding on both parties. The government of the day in 1889 denied the validity of the agreement and challenged the right of the company to operate its telephone exchanges after the expiration of the concession of 1884 on September 8, 1889.¹ Let us draw a veil over this discreditable controversy. Parliament passed an act on July 16, 1889, providing for the purchase of the company's plant. The company announced its refusal to surrender possession, and on September 1, 1889, the government took possession by force.²

Such was the termination of the French telegraph administration's attempt to shift the risk of initial experimentation with the telephone to the shoulders of private enterprise. The plan was badly conceived and badly executed. It did not secure a rapid and extensive utilization of the telephone. It did not spare public authorities the burden of experimenting on their own account. It did enable them to regain the control of the telephone when it proved likely to become a dangerous competitor of their telegraphs. But in order that the authorities might have that privilege, the telephone user had to pay roundly.

The policy of calling in private enterprise in order to undertake initial risks of which public authorities, responsible for the conduct of important business undertakings, desire to be relieved, is a seductive one. It appears to be an easy mode of dealing with a difficult subject. In fact, it is not easy to pursue this policy with success. In France, as applied to the telephone, the policy accomplished the main object in view, but in a bungling manner.

¹ Cochery Rapport, pp. 135-148, contains a full account of the legal contest which ensued. The courts ultimately supported the telegraph authorities in their contention that the secret agreement was invalid. The dispute over the amount of compensation due the company for the plant seized by the government resulted in a compromise award. The company claimed fr. 18,877,633; the telegraph authorities were willing to pay only fr. 5,068,435. The Conseil d'État on May 16, 1896, fixed the amount of compensation at fr. 11,334,340, including interest.

² Lacombrade, pp. 95-105.

CHAPTER XVI

THE DEVELOPMENT OF THE FRENCH GOVERNMENTAL TELEPHONE SYSTEM

IN France, contrary to the arrangement in Germany and Switzerland, the responsibility for the actual management of the governmental telegraphs (and hence also of the telephones) is vested in the same hands as is that of the postal service. This official, the Under-Secretary of State for the postal and telegraph service, is, however, subordinated to the Minister of Public Works (from 1878 until 1906 to the Minister of Industry and Commerce). Both the Under-Secretary and his chief, the Minister, are selected by the President of the Council of Ministers (that is, the Prime Minister), but they hold office at the pleasure of the representatives of the people, and can be forced out of office without affecting in any way the position of the nominal head of the ministry. Thus in his conduct of the public offices he is subjected to the control of the representatives of the people, whose property he administers.

First, there is the control of the organs of public administration by the political representatives of the people. In France this control is theoretically complete. The legislature is elected by universal suffrage, the Chamber of Deputies directly, the Senate indirectly; and the Executive, or at least the real Executive, the Ministers, are responsible to it for their conduct of affairs. The representatives of the people exercise their theoretical control of the conduct of public business through their control of the budget and, in extraordinary cases, by direct interpellation of the Ministers, which may be followed by a vote of want of confidence and the consequent resignation of the condemned officials. Ordinarily, however, the deputies confine their criticism of the conduct of public business to the annual debate on the budget,¹ in which each branch of the administration is forced to declare

¹ Cf. René Stourm: *Le Budget*. 6th edit., Paris, 1908.

the amount of money which it desires to spend during the ensuing year, and the purposes for which each particular item is to be used.

Before attempting to discuss and vote the desired appropriations, Parliament commissions a number of its members to make a minute study of the proposals of the administrative authorities, with a view to determining the expediency of each separate item. For this purpose the commission on the budget holds a number of special sessions in the fall of each year, to which the heads of departments are often summoned in order to give such an account of their operations and plans as may be desired. For convenience in executing its task, the commission on the budget is divided into a number of sections, to each of which is confided the labor of criticizing the estimates of one department. Thus there is a special report each year on the conduct of affairs by the postal and telegraph authorities for the preceding year and on their plans for the next. Only after receiving this report does the Chamber as a whole attempt to criticise the work of the postal and telegraph authorities, or to suggest alterations in their plans for the future.

Besides the opportunity for criticism of the conduct of public business which is afforded by the responsibility of the French executive to the political representatives of the people, an independent organization exists for the representation of the special interests of private business men. The economic representatives, so to speak, of French industry and commerce in their professional relations with the executive branch of the government, are the *chambres de commerce* and the *chambres consultatives des arts et manufactures*.¹

These legal representatives of the "world of affairs," as the French would say, in its relations with the public authorities were created by Napoleon Bonaparte in accordance with his plan for the reorganization of the administrative system of his empire. Like most successful institutions, the *chambres de commerce* were a modification of an existing institution in response to an altered

¹ Cf. Maurice Block: *Dictionnaire de l'administration française*, 5th edit., 1903, articles, "Chambre de commerce," etc. The official organ of the French chambers of commerce is the *Journal des chambres de commerce*, published since 1882.

need. The first compulsory organizations for the purpose of representing special economic interests were the chambers of commerce which came into existence in a number of the important commercial cities under the *ancien régime*. The local bodies often received as chairman the provincial intendant, and the whole system was centralized by the erection of a *conseil de commerce* with the function of informing and advising the Minister of Commerce at Paris. This organization fell a sacrifice during the Revolution to the dominant distrust of organization in general. With the reconstruction of French administration under Napoleon, the utility of the old chambers of commerce was recognized and the organized representation of commercial interests was restored. The Napoleonic chambers of commerce were established over so much of Europe as was then under French influence.

Their constitution is now regulated by the law of April 9, 1898. They are established by decree of the Minister of Commerce and Industry, and there must be at least one in each department of France. A chamber may have from nine to twenty-one members, except that at Paris, which contains thirty-six. Each member is elected for six years, one third retiring at the end of each second year. The eligible electors comprise all business men, active or retired, of at least thirty years of age, who have been inscribed on the list of business-tax payers for at least five years and reside in the district which the chamber is intended to represent. The names of candidates for election to chambers of commerce must be submitted in advance to the Minister of Commerce and Industry for his approval. The functions of the chambers are to give advice to the minister on matters in regard to which their advice may be sought and in general to promote the commercial and industrial interests of the localities which they represent. The separate chambers of commerce are not united in any central organization but report, each directly, to the Minister of Industry and Commerce. Chambers are allowed to hold property, like corporate bodies, and are maintained by means of a special surtax attached to the ordinary business tax in each district by the chamber representing that district. Thus, in 1907, the Chamber of Commerce at Paris represented the 28,432 persons who were assessed for

the business tax on the businesses of Paris in 1906. The total yield of the tax in that year was over fifteen million francs, and the revenue of the Chamber itself was three hundred thousand francs. In 1907 there were in all France 143 chambers of commerce.¹

These economic representative organs were created by Napoleon simply to represent a portion of public opinion which found inadequate representation under the existing state of French representative institutions. He probably never intended that they should become anything more than advisory bodies. Nevertheless the chambers of commerce not only play an important part in the public representation of private, and especially of business interests, but have also been charged by the public authorities with the performance of administrative duties of ever increasing importance.

The enlistment of such quasi-public bodies in the work of public administration cannot be understood without some reference to the financial condition of the French government. French finances had long suffered from chronic deficits. The disastrous war of 1870-71 with Prussia, together with the necessity of preparing to make a better fight the next time, greatly increased the need for public revenue. For years, without a break, current expenditures regularly exceeded the receipts. The nation sank ever deeper and deeper in debt. Colson has computed the increase of the French national indebtedness caused by these recurrent annual deficits, after making due allowance for payments towards amortization

¹ Docs. parl., Ch. des dép., 1907. Annexe no. 1239. *Rapport sur l'exercice pour l'année 1908* (Ministère du Commerce et de l'Industrie), p. 1689. At the same time there were forty-six *chambres consultatives des arts et manufactures* (*Ibid.*, p. 1690). These chambers were originally created with a view to the representation of the arts and crafts, whereas the chambers of commerce were intended to represent only the strictly mercantile undertakings. But as a result of the economic changes of the nineteenth century, the successors of the independent artisans and handicraftsmen of a century ago, so far as they have not become dependent wage-earners, have, for the most part, lost their interest in a separate economic representation. The chambers of commerce have encroached more and more on those of the handicrafts, so that at present the latter seem to have outlived their usefulness. In 1907 their amalgamation with the chambers of commerce was recommended by a commission of the Chamber of Deputies on the budget as the best means of disposing of an obsolete institution.

and omitting the Prussian War indemnity of 6,000 million francs.¹ The total public debt in 1903, national and local, amounted to some 35,000 million francs. Of this enormous sum 9,732 million francs, or more than one fourth, was the result of the successive annual deficits since 1869. These deficits actually began as early as 1836. Thereafter for two whole generations the French government never once succeeded in making both ends meet. With the ever growing accumulation of past obligations staring them in the face, the French deputies were very loath to increase the national liabilities, except for the one supremely important purpose of the national defense.

The chief stress in the argument of the French telegraph administration, which resulted in the adoption of the policy of public ownership in 1889, was laid not on the theoretical advantage of that policy, but on the ways and means of carrying it into effect without putting a financial burden on the public treasury.² Once the legislative branch of the government was convinced that the retention of the telephone in the hands of private enterprise meant the exposure of the public revenue from the telegraphs to the danger of serious depletion, its chief concern was to ascertain that the acquisition of the telephones could be carried through without subjecting the public revenues to even greater liabilities.

That this could be done the telegraph authorities believed they had already demonstrated by their own experimentation with the conduct of exchange systems. The conditions for joining the governmental telephone exchanges, which had been established by virtue of the law of 1882, were the following:³ The annual rate was fixed at 250 francs, which was reduced to 200 francs in exchanges with more than 300 subscribers. In addition to this charge, an annual contribution was required to cover the expenses of the connection of 125 francs per kilometer of single wire on an existing pole-line, or 250 francs if a special pole-line had to be constructed. The charge per kilometer was reduced to 125 francs for lines sup-

¹ C. Colson: *Cours d'économie politique*, tome iii, p. 384. Paris, 1905.

² Cochery Rapport, pp. 122-134.

³ Rousseau, Appendix 2. Lacombrade, (Ch. 3, part 1) states the early rate to have been 200 frs., which was reduced to 150 frs. when the number of subscribers surpassed 200.

ported by roof-standards, and raised to 500 francs for lines constructed underground. This contribution might be paid down in a lump sum in advance, or distributed over a period of four years in equal annual installments. In the latter case the subscriber was bound to sign a contract for a like period. The ordinary contract ran only one year. Besides this contribution the subscriber was required to buy his own telephone instrument, choosing from models approved by the telegraph department, and to defray the expense of installation.

This policy was severely criticised at the time as an unwarrantable shifting of the business man's burden to his customer.¹ The latter, it was argued, should be required to pay only for the service rendered him, and not to contribute to the capital of the undertaking. The government sought to justify its policy on the ground that the telephone was not of general benefit, but of use only to a small class in the community,² and that the members of this class could be called on to equip themselves with telephone paraphernalia with as much propriety as with office furniture of any other sort. The real reason, however, for the government's policy was not that the method chosen served best for conducting the telephone business, but that the telegraph authorities could not so easily obtain their capital in any other way. By this means they were able to make the slender appropriation which Parliament had granted them go much further than would otherwise have been possible.

This policy was continued throughout the period of mixed private and public ownership. On the average, thereby, the entire expense of construction was recouped in two years and eight and one half months.³ How rapidly the company recouped its capital with its inflated charges of 600 and 400 francs can only be conjectured. In all probability the company's more insidious method of recovering its capital was equally, if not more, efficacious. The government's system of finance sufficed for the exchanges which were established with the original appropriation of 1882. But when the original appropriation was exhausted there was no means of erecting new

¹ Rousseau, p. 15.

² *Ibid.*, pp. 58-59.

³ Cochery Rapport, pp. 10-14.

exchanges except with the profits of the existing ones. Hence work was practically confined to the few places in which it was originally inaugurated. When other cities began to call for a governmental telephone exchange, their applications had to be refused until a new method of financing could be devised.

The solution of the difficulty was suggested in 1888 by the city of Limoges.¹ The local authorities of that city desired a speedier creation of telephone facilities in their community than they could hope to secure as matters then stood either from the company or from the government. Consequently they offered to advance the cost of construction of the central office and of equipment without interest, in the expectation of being repaid as quickly as possible out of the proceeds of operation. It was estimated that these costs would amount to about 18,000 francs, or 350 francs for each of the 50 subscribers who had signified their intention of participating in the scheme. Each subscriber's line would cost on the average 150 francs a kilometer, and the operating expenses and maintenance charges for each of the first two years would come to about 100 francs each more. By fixing the annual subscription at 200 francs and in addition assessing against each subscriber his share of the running expenses, as well as the cost of his own line and equipment, as under the existing arrangement in the government's exchange systems, the portion of the initial expenses advanced by the municipal authorities would be recouped within two years, provided the subscribers were permitted to pay their assessments one third in advance and the balance in two annual installments. Thus during the first two years of the service the subscriber would pay no more than the annual rental then charged by the company. After that time he would obtain the service much more cheaply than under the company's schedule of rates. The municipal authorities would quickly receive back their advances and then turn the system over to the telegraph authorities. The latter would thus be relieved of the initial burden of establishing the service, and after two years would receive a valuable plant free of charge. The expenses of

¹ Cochery Rapport, pp. 37-41. Cf. *Rapport sur les projets de loi concernant l'établissement des réseaux téléphoniques dans les villes de Limoges et Grenoble*. Docs. parl., Ch. des dép., 1888, No. 3164.

operation and maintenance would thereafter be amply covered by the annual subscription.

This plan was beautifully adapted to the needs of the hour. On the one hand, those who wanted a telephone service were provided with a mode of getting it. On the other, the government was enabled to go into the telephone business without increasing the financial burdens of the public treasury. The plan was no sooner proposed than other cities cordially indorsed it. The telegraph authorities gave it their hearty approval. In 1888 two bills were enacted authorizing the construction of exchanges in accordance with this plan in the cities of Limoges and Grenoble.¹

The proposal of the telegraph authorities in 1889 was to extend this method of operation to the entire French telephone system after the acquisition of the exchanges then in possession of the *Société générale des téléphones*. In order to do this the only appropriation that Parliament would be called upon to make was the sum required to purchase the plant of the company. Obviously, none of it would have to be paid at once. Already fifteen cities, besides those provided for in the acts of 1888, had applied for permission to establish exchanges on similar terms.² The plan was certain to go into effect under favorable auspices if Parliament would only accept it. Parliament did accept it. The same law which provided for the purchase of the plant of the *Société générale* authorized the employment of the Limoges plan for financing the construction of new exchange systems.³

In the following year the same plan was extended to the financing of long-distance lines.⁴ It was believed that here again the local public authorities were better situated than the central authorities for ascertaining the local needs and in consequence would be less likely to engage in unwise construction. The law of 1890 placed the burden of the construction of long-distance lines, as of local exchanges by the law of 1889, on the shoulders of the local authorities. The expenses of operation and maintenance, however, were to be borne by the central authorities from the start. Both the law of 1889 and that of 1890 contemplated the sharing of the

¹ Loi du 22 déc., 1888.

² Lacombrade, p. 92.

³ Loi du 16 juillet, 1889.

⁴ Loi du 20 mai, 1890.

burdens of the local authorities by private and non-political public organizations. The chambers of commerce especially were expected to bear an important part of the burdens of local initiative, since they represented the only portion of the community which up to that time had displayed any interest in the telephone.

The operation of this development policy can be best explained by describing the actual telephone development in some particular locality. To an official of the French telephone service, stationed in Nîmes, I am indebted for the following narrative.¹

Nîmes is a city of some commercial importance, situated in the south of France, the capital of the department of Gard, with a population in 1901 of 80,605. The establishment of an exchange system was brought about by the personal efforts of a local business man, M. Maurice Nègre. By dint of special solicitation and not without considerable difficulty, he secured thirty-two subscribers, and on March 1, 1892, the exchange was opened. In order to secure a wider utility for his undertaking, M. Nègre hastened to bring it into connection with the neighboring cities of commercial importance. In August of the same year he was able to bring about the construction of a long-distance line to Cette on the Mediterranean by way of Montpellier and Narbonne. The sum advanced by the local interests of Nîmes to the telegraph administration to defray the cost of construction of the exchange was 14,000 francs, and was wholly paid back in February, 1893. The long-distance line also cost the local interests 14,000 francs, and the advances were all repaid in February, 1894. Within three years, communication was established with Marseilles, Toulouse, Bordeaux, Limoges, and other places, but not yet with Paris. At last, in 1896, by means of a combination effected between the departments of Gard and Hérault, the cities of Nîmes and Montpellier, and the Chamber of Commerce of Avignon, long-distance connection with Paris was established by way of Lyons. This line served also to connect Paris and Lyons with Avignon and Cette. The share of the costs borne by the department of Gard was 80,000 francs, and by the city of Nîmes 25,000. About this

¹ Édouard Renard: *Les Télégraphes et le Téléphone dans le département du Gard*. Nîmes, 1897, pp. 77-92.

time a project was brought up to connect with one another the chief places in all the cantons of the department, but was abandoned as too big an undertaking. The telegraph administration demanded a contribution of 431,000 francs, and the return seemed too uncertain to warrant the department in incurring the risk.

Meanwhile the same sort of private and local initiative was bringing about the creation of exchange systems and the extension of long-distance communication throughout France. In the first five years after the adoption of the Limoges plan, the number of exchanges in operation increased more than tenfold. Everywhere the initiative came from enterprising local business men acting sometimes through the local municipal and departmental councils and sometimes, especially in the construction of long-distance lines, through the chambers of commerce. The local political and commercial representative bodies were quick to recognize and quick to respond to the special local needs existing in their districts. As a method of adjusting the supply of a monopolistic service to a purely local need, the French development policy possessed distinct merits.

In certain respects this French system of local initiative excelled the Scandinavian coöperative system.¹ Under any system of coöperation a difficulty arises as soon as the original coöperators are called on to admit later comers to a share in their undertaking. It is often considered unfair that the founders should make all the initial sacrifices and the later comers thus reap where they have not sown. Yet a satisfactory method of apportioning initial expenses among future members of a coöperative undertaking is exceedingly difficult to devise. The original coöperators must either become practically the same as stockholders in an ordinary joint stock company, or forego all tangible reward for their services in starting the enterprise. In the former event the advantages of coöperation become illusory; in the latter they remain real but are greater for the shiftless and mean individuals who wait longest, than for the public-spirited individuals who made the initial sacrifices. The French plan required the founders of a

¹ Described in Part IV, ch. xxi.

local telephone system to make sacrifices from which later comers would derive the benefit. The fact that the initial investment was to be made at the expense of public authorities did not enable them to distribute the entire burden evenly throughout the entire local community, since the original advances were recouped by special assessments on those subscribers who joined the system before its transfer to the central authorities. However, the burden of interest on the original loan would be diffused throughout the community represented by the local authority which should incur the loan. To that extent the French plan avoided some of the disadvantages of private voluntary coöperation by combining it with public compulsory coöperation.

Its weak points, however, were serious. In the first place, the local authorities were required to make a real financial sacrifice and yet were deprived of all expectation of reward; for the local authorities paid the interest on the original loans, whereas the telegraph administration reaped the profits as soon as they were earned. The loans themselves were repaid, but the interest was not. This failure to repay the local authorities in full was wholly unwarrantable and in practice simply amounted to a tax on telephone development. In general, the expectation of future profits compensates for preliminary losses. Under this plan, however, if the burden of interest should have to be borne for an unexpectedly long period, there would be no hope of compensation. The deprivation of the expectation of profit alone was enough to check the development of the industry, but the impossibility of recovering the sums paid in interest made the matter worse. The effect was to discourage the taking of risks which would have been undertaken under normal conditions.

In the second place, local initiative was seriously defective as an agency for maintaining and extending the telephone systems. At first, to be sure, fresh construction was undertaken freely. The accumulated unsatisfied wants of a decade of lethargic management on the part of both the company and the telegraph administration had to be met. But when these had been satisfied further construction began to drag. The local authorities were in no position to reconstruct exchanges, which had been turned over to the

central authorities and had since become too small to handle the increased local traffic, or in which the apparatus was worn out or become obsolete and required to be replaced by new. Nor was their position with regard to the long-distance branch of the business much better when it happened that the lines originally turned over to the central authorities became inadequate. Local authorities which had advanced the funds for the first long-distance connection between two places were reluctant to undertake the second. They argued that once the government had been given possession of a line, it was bound not only to keep it in good order but also to make extensions when needed. The local authorities willingly started the service, but they expected the telegraph administration to maintain it. To be sure, some local interests which felt a particular need with peculiar intensity would make a corresponding sacrifice rather than dispense with the service that they desired. Thus in 1895 the long-distance service between Paris and Le Havre became inadequate to accommodate the increasing traffic. Two lines were already in operation, but a third was urgently needed. Since the government neglected to act, the Chambers of Commerce of Paris and Le Havre took the matter into their own hands. The cost of construction was estimated by the government at 92,000 francs, and was furnished three fourths by the Chamber at Le Havre and the balance by that at Paris. The line was then promptly erected.¹ In general, however, the refusal of the telegraph administration to relieve the local authorities of the task of improving or extending telephone systems which had once been turned over to it, tended to prevent the further improvement or extension of such systems.

Finally the premises on which the French system of local initiative was based were false. The telephone does not meet a purely local need. On the contrary its usefulness increases, other things being equal, the greater the distances between the localities which it serves. In France, indeed, the need is greater for communication between Paris and the provinces than for communication between different provincial departments, even between those that are comparatively close together. And local exchange sys-

¹ *Journal de l'électricité*, June 29, 1895.

tems derive much of their utility from their capacity for making the long-distance service more available to the local community. This was the very class of construction which the French system was least capable of coping with. The local authorities might meet the local needs tolerably well at first, but were in no position to plan and carry out properly the construction of the main trunk lines. The decentralization of initiative was bound to result in an uneconomical lack of coördination in the planning of the most important long-distance connections.

The defects of the French development policy were clearly recognized as early as the year 1894. The commission of the Chamber of Deputies which examined the proposals of the postal and telegraph administration for expenditures on the telephone service during the ensuing year set forth these defects in its report to the Chamber.¹ "The majority of the lines," it observed² with reference to the inter-urban telephone connections, "have been originally established to satisfy the modest desires of the local commercial interests. These were at first limited to the opening up of telephone communication with the most important neighboring city with which the local interests were connected by commercial ties. With the development of these local inter-urban systems, however, new desires have sprung up, and the majority of the places now supplied with telephone service wish to be connected with Paris. . . . In order to promote the further development of telephony, the construction of these main trunk lines will very soon be indispensable, and it is doubtful if the funds can be secured from the local interests. It is furthermore easy to see that direct appropriations by the central government itself will shortly be required in order to make the needed improvements and extensions in the local exchange systems."

Yet the commission, strangely enough, did not practice its own precepts. On the contrary it pointed with obvious pride to the fact that it had cut down by ten per cent the increase of expenditure proposed in the estimates of the telegraph administration.³ A few pages farther on in its report it declared the telephone ser-

¹ Docs. parl., Ch. des dép., 1894, Annexe no. 966, pp. 1861 ff.

² *Ibid.*, p. 1888.

³ *Ibid.*, p. 1861.

vice in Paris to be unsatisfactory, and blamed the administration for its failure to show more enterprise in the conduct of its affairs, and for not asking for bigger appropriations in order to make the necessary improvements in the service.¹ The apparent contradiction in the attitude of the commission on the budget can be explained only by its desire to economize. At that time parliamentary financiers were possessed by the one idea of economy, highly laudable in itself, but under the existing conditions unfortunate for the telephone service. The result was that nothing was done to put more adequate means at the disposal of the telephone administration, and matters were allowed to drift along under the confessedly defective development policy.

It was not until 1899 that the telegraph authorities made any change. At that time they sent out a circular letter to the prefects of departments, inviting them in connection with the departmental councils to take up the work of long-distance telephone construction where it had been left by the municipal and other local authorities and to coördinate the work of extension.² They were urged to arrange for the connection of the communes with the chief towns of the cantons and the latter with those of the department. Then the main long-distance lines should be so constructed as to connect these departmental centers with Paris. This letter gave a new impetus to long-distance construction and brought about a considerable improvement in the state of long-distance connections.

Up to December 31, 1902, the total amount of the advances made by local authorities, both departmental and municipal, by chambers of commerce and by private individuals, was nearly 40,000,000 francs.³ Of this amount not quite 18,000,000 francs had been repaid. Most of the sums advanced, however, were recovered within half a dozen years, and a large portion within two or three years. Yet this was a wholly inadequate investment with which to supply a nation of nearly 40,000,000 people with telephones. Moreover, since the Limoges plan of financing fresh construction made no provision for replacing obsolete plant with

¹ Docs. parl., Ch. des dép., 1894, Annexe no. 966, p. 1863.

² Lacombrade, p. 112.

³ *Ibid.*, p. 259.

new or improved material or for reconstructing exchange offices which had become too small for the increase of traffic, the French telephone system did not even handle well the stunted telephone business which it did try to handle. As time went on the French telephone system bade fair to become less and less adequate to meet the demands made upon it and less and less efficient in performing this inadequate service. In 1900 the French first began to speak of a telephone crisis.¹

At that time some of the most important provincial cities had no direct connection with Paris. Many long-distance lines were so overloaded with traffic during the busier portions of the day that telephone users, discouraged by the long waits, frequently abandoned their attempts to secure the connection for which they had asked. The local exchange service in the more populous centers was even worse. At Lille the multiple switchboard was completely utilized and additional subscribers had to be accommodated on supplementary switchboards of an obsolete pattern. This caused both loss of time and needless expense. At Paris the conditions were just as bad. The increase of facilities had long since ceased to keep pace with the growth of the use of the telephone, and the methods of operation were as vexatious as they were antiquated. These conditions were becoming worse instead of better, and were bound to continue to become worse so long as the prevailing policy was maintained.

This gloomy prediction was the official forecast of the head of the French postal and telegraph administration.² A. Millerand, one of the more conservative of the leaders of the socialist party in France, had been given that place in the radical cabinet of Waldeck-Rousseau. He was a man of real administrative ability, and was especially qualified for his position by earlier experience in the Chamber of Deputies on the commissions to which the financial estimates of the postal and telegraph services had been referred. On being appointed to a cabinet position he attacked his new duties with a genuine zeal for reform.

¹ *L'Économiste français*, 1901, p. 727.

² *Rapport au Président de la République de M. Millerand du 1^{er} mai, 1900. Journal officiel du 12 mai, 1900, pp. 2985-3012.* Cited as Millerand.

The time had come, he declared,¹ for the telegraph authorities to dispense with local and private contributions and to extend the telephone service hereafter out of the national resources. In regard to the long distance business, he observed: "We shall be able, indeed, under the pressure of the necessities of the economic struggle for existence to find still a few persons who will be willing to make sacrifices in order to create new means of communication, but it will be difficult to exact fresh financial support for the doubling of the existing lines which have been rendered inadequate by the increase of traffic, or to establish inter-urban connections which are of no particular concern, but are needed in the interests of the service as a whole." And again he remarked in regard to the exchange business, "The inefficiency of our business methods is only equaled by the inefficiency of our antiquated apparatus and the inadequacy of our personnel." He estimated that one hundred and thirty additional operators were needed at once. Worst of all, excessively high rates were maintained, not in order to avoid a deficit (for the service was yielding a good profit), "but as a dike against the too rapid increase of the number of subscribers."²

The cause of the trouble he ascribed to the failure of Parliament to make adequate appropriations.³ For example, since the end of 1897 only one and three quarter million francs had been appropriated to be applied to the general needs of the exchange system at Paris. The Limoges plan of finance was bound to break down as soon as the initial work of establishing local systems was completed, yet Parliament still failed to recognize that a great business like the telephone could not be properly carried on and extended except by the free use of fresh capital supplied by the central authorities themselves. Millerand outlined a comprehensive plan of reconstruction and extension, the adoption of which alone would place the telephone system in a position to yield the maximum service to the community. At the same time, the

¹ Millerand, pp. 2997-3000, contains that part of the discussion which relates to the telephones; the entire postal and telegraph service was declared to be in need of reorganization.

² Cf. ch. xviii, *post*.

³ Millerand, p. 2997.

rates, especially the exorbitant rate in Paris, should be reduced. In order to accomplish these reforms, however, Parliament must appropriate money. "The investment," he declared, "is so excellent and so certain that no business man would hesitate to sink his capital in the enterprise."¹ But would Parliament do it? Parliament would not.

The French deputies maintained the ground they had always held. The government's financial position had improved somewhat during the last decade. The deficits were no longer so large as they formerly had been. Even a small surplus was obtained at the end of the century. The postal and telegraph revenues, however, had been an important factor in the establishment of budgetary equilibrium. Neither the deputies nor the ministers themselves wished to risk any portion of the public revenues. Consequently they declined to burden the budget with appropriations for defraying the cost of telephone construction. The telegraph administration was left as before to devise its own means of raising the capital required to carry on the business.

In its refusal to substitute a policy of central initiative for the Limoges plan, Parliament appeared on the whole to have the support of the business interests of the community. Indeed, the latter were no less averse to appropriating the public money for expenditure on the telephone system, than were their responsible representatives. The official organ of the French chambers of commerce commented on Millerand's report and proposals in its next issue.² Business interests, it observed, appreciated the fact that the government at last recognized the unsatisfactory state of the postal and telegraph service, but they deplored the nature of the means selected to bring about an improvement. Millerand would meet with more approval for his projects, the commentator continued, if he would confine his attention to internal economies in the conduct of his department and dispense with increased appropriations. Thus Millerand, the enterprising, met with little encouragement from that quarter.

¹ *Ibid.*, p. 2998.

² *Le Journal des chambres de commerce et de l'industrie, des chambres consultatives, et des chambres syndicales*, May 25, 1900, p. 231.

Despite the cold reception accorded to his report, Millerand felt able a year later to issue a decree, promising the speedy introduction of the more urgent improvements in the telephone system.¹ A number of exchanges, especially in Paris, were to be reconstructed and enlarged at once. These alterations would be completed by the end of the following year (1902). Then the flat rate in Paris should be reduced from 400 to 300 francs and at Lyons from 300 to 250 francs. Subscribers would still be obliged to furnish their own telephone instruments and, outside of Paris and Lyons, to defray the cost of connection between the central office and the subscriber's station. Besides the improvement of the exchange service, the decree promised the construction of additional long distance lines.

The most important of these changes, the reduction of the flat rate at Paris and Lyons, was conditional on the enlargement of the exchanges in those cities. Unless this were done, the increased business that would follow the reduction of rates could not be handled with the existing inadequate facilities. But the work of enlargement itself was dependent on securing the wherewithal to defray the cost. Accordingly, at the same time that the decree was issued, the government introduced a bill into Parliament calling for a special appropriation in order to enable the telegraph administration to make the most urgent improvements out of its own resources. This deviation from the policy of local initiative did not commend itself to the leaders of financial opinion in Parliament, and the bill was withdrawn.² The telegraph administration was once more left to its own devices to find the means for improving its service. The result was that for the time being the service was not improved.

At the reconstruction of the Waldeck-Rousseau ministry after the death of its chief in 1902, Millerand lost his portfolio. Yet his three years at the head of the department which was charged with the conduct of the telephone service had not been wholly without effect. If he had not accomplished great positive results by his own efforts, he had at least pointed out the path in which his

¹ Décret du 7 mai, 1901. *Journal Officiel* du 8 mai, 1901.

² Lacombrade, p. 290.

successors must tread if they would establish the telephone undertaking on a businesslike basis. He had officially declared that the stage had been reached in the development of the telephone business which was anticipated by the commission on the budget in its report of 1894. The time had already come when the government should dispense with private and local aid in financing its telephone undertaking. There was no longer any excuse for failure to recognize that only the copious investment of capital by the central government itself could save the country from a telephone crisis, a crisis not of over- but of under-production.

In another branch of the work of his department, Millerand was forced to content himself with rendering a similar service. In the period before the invention of the telephone the French telegraph administration had made no more pretense of incurring financial risks in extending the service than they had since that event.¹ Municipalities desiring the installation of telegraph facilities were required, according to the importance of the place, to contribute 50 or 100 francs per kilometer of new line, or 25 or 50 francs per kilometer of wire strung on old poles, and, if no post office was on hand to serve also as telegraph office, 250 or 300 francs towards the cost of establishing that office. The local authorities were required also to furnish the office, to make good any deficiencies if operating expenses should not be covered by receipts, and finally to pay the cost of delivering messages. These contributions amounted on the average to more than one third of the original cost of construction and guaranteed the state against loss on operation. These conditions tended to discourage communes from applying for the establishment of telegraph offices, not so much on account of the contribution towards the first cost of construction, as on account of the dread that they might be called on indefinitely to meet deficiencies in operation. By shifting so much of the risk of their undertaking to the shoulders of their local authorities, the public telegraph authorities may have increased their own profits, but only at the cost of the widest utility of their service.

These conditions for the establishment of telegraph stations remained in force even after the introduction of the telephone.

¹ Millerand, p. 2995.

Rural villages were at liberty to substitute the telephone for the telegraph in order to cut down operating expenses, as was done in Germany and Switzerland, but this substitution was their private concern, not that of the telegraph administration. The latter had destroyed its interest in promoting such a substitution by declining to assume the risk of extensions into the rural districts. Hence, it was not prompt to bring the alternative mode of establishing connections with the general telegraph system to the notice of the rural authorities. In fact, it was not until 1896 that the telegraph administration made any special effort to encourage the use of the telephone in rural offices in place of the telegraph.¹ The failure of the telegraph administration to act sooner simply prevented rural authorities for almost two decades from utilizing the more economical apparatus.

In 1900 Millerand declared that the conditions for the establishment of rural offices were impeding the desirable development of that branch of the service. At that time there were still 23,800 communes without connection with the general telegraph system of the Republic, of which 3400 possessed more than 1000 inhabitants. In order to promote the further extension of the rural telegraph service, Millerand proposed that the local authorities should be relieved of the obligation to cover deficits in the operating expenses. The payment of distributors of telegrams ought also to be assumed by the central government; but this, he reluctantly admitted, would overburden the postal and telegraph finances in their existing state and for the moment could not be recommended. However, the other modification in the terms for establishing rural offices would relieve 840 local authorities, who were then compensating the telegraph administration for deficiencies in the local receipts, of an average annual charge of 225 francs each. This modification would also encourage other local authorities to apply for offices and thus bring about a considerable increase in the total number of rural offices. He recommended increase of the appropriation for the telegraph service to make possible this change in the rural development policy. But this was not done.²

¹ Ministerial circular of Feb. 11, 1896. *Journal Officiel*, Feb. 12, 1896.

² Docs. parl., Ch. des dép., 1906, Annexe no. 3046, p. 140.

For two years after the publication of Millerand's open letter to the President of the Republic, the telegraph administration was left to its own financial devices. So far as the Parliament or the responsible ministry was concerned, the policy of local initiative was still in force. When the telegraph administration realized that it could not hope to obtain funds from Parliament in the immediate future, it had recourse to the same expedient that had been previously adopted on the occasion of the purchase of the plant of the *Société générale des téléphones* in 1889. A sum of 10,000,000 francs was borrowed from the *Caisse des dépôts et consignations* to be repaid in five annual installments.¹ This makeshift, however, could not even enable the administration to keep pace with the current increase of traffic. It was absolutely no compensation for the lack of adequate capital in the past.

Finally the danger of further persistence in this financial policy was recognized by the financial authorities themselves. Since it was their desire for revenue from the postal and telegraph undertaking that had kept down the annual appropriations, as soon as they were convinced that a freer use of capital would bring in larger profits they were ready to adopt a more liberal policy. In the session of 1903 one of the socialist deputies remarked:² "The treasury is entitled without doubt to make profits out of the postal service, but a portion should be re-invested in the business. Otherwise large profits will be realized in the present at the expense of the future. If the business continues to be conducted as hitherto it will not be long before the service will be incapable of meeting the demands that will be made upon it. . . . There will be a crisis. The chambers of commerce will complain, and you will have to spend thirty or fifty millions all at once, and hence wastefully." This conviction that not only the good of the service, but also the profit of the treasury, required a change of policy was at last accepted by the financial powers of the day.

¹ Lacombrade, p. 22a. This *Caisse* was established in 1816 in order to provide a place of absolute security for the deposit of private property. The total deposits at the end of 1902 were over 7,000 million francs in value. They are placed under the public faith. Cf. Block: *Dictionnaire de l'administration française*, 5th edit., 1905, vol. i, pp. 445-467.

² Débats parl., Ch. des dép., Nov. 26, 1903. Speech of Marcel Sembat.

A special law was enacted November 23, 1903, appropriating the needful funds for the construction of three multiple switchboards at Paris and of one at Lille, and for the extension of the exchange at Lyons. Two of the switchboards at Paris and that at Lille were to be ready at the end of 1905 and the rest in 1906. Another special law enacted on July 19, 1904, authorized the telegraph administration to participate to the extent of not more than 6,000,000 francs in the construction of long-distance lines of general interest.

Unfortunately the relief was too late. Before the new works could be completed the crisis came.¹ In the summer of 1905 the inadequacy of the telephone facilities to handle the traffic became intolerable. The main long-distance lines, even if in good working order, would have been overcrowded. In fact, their technical state was so bad that interruptions were frequent and of long duration. During the twelve months between July 1, 1905, and June 30, 1906, a special enumeration was made of the delays that resulted from interruption of the service.² Between Paris and Lyons there were five lines. The total number of interruptions was 550 and their average duration 10 hours and 26 minutes. Between Paris and Marseilles there was only one line. The total number of interruptions was 204 and their average duration 14 hours and 28 minutes. In other words, for a good portion of the year there was no direct long-distance communication between the capital of France and its greatest seaport.

The condition of the local exchange business was not so bad in the small localities, but in the larger ones it was worse.³ In Paris, where the number of subscribers was greatest and their requirements most exacting, the crisis was most acute.⁴ In 1905 the average number of derangements of subscribers' lines ranged from

¹ *Rapport sur le budget des postes, télégraphes et téléphones pour 1906*, par M. Sembat. Docs. parl., Ch. des dép., 1905, Annexe no. 2672; pp. 1388-1524. Cited as Sembat I. *Rapport supplémentaire*, par M. Sembat, 1906; Annexe no. 3046, pp. 128-171. Cited as Sembat II.

Rapport sur le budget des postes, etc., pour 1907, par M. Steeg. Docs. parl., Ch. des dép., 1906; Annexe no. 347, pp. 1849 ff. Cited as Steeg.

² Steeg, pp. 1867-1869.

⁴ *Ibid.*, pp. 1863-1867.

³ Steeg, p. 1867.

19 each in the Gutenberg exchange to 10 each in one of the less important exchanges. The average time employed by the exchange operators in making a local connection was one minute and fifty seconds. This is about five times as long as is required in the American metropolitan exchange systems. Poor as the service was, it could not be improved without making it poorer, for the increase of subscribers which would have resulted from any improvement in the character of the service would have rendered the system incapable of operating at all. Its reputation was such that many persons who would have liked to become subscribers were discouraged from making application, since they knew the administration would be embarrassed to accommodate them. Indeed there would soon be no means of accommodating the increase of subscribers, if it continued even at the existing rate. But the service could not be prevented from growing despite its unsatisfactory character and the excessive charges. By the end of 1906 the limit was reached. January 1, 1907, there was no space at either of the most important exchanges of Paris for the accommodation of additional lines. At Gutenberg there were then 17,650 subscribers' lines, although the exchange was designed for only 16,000. At Passy there were 9600 lines connected with an exchange designed for 8400.

The direct cause of the telephone crisis was twofold.¹ First, the plant was insufficient in quality and obsolete in design. Secondly, the operators were not properly trained and were given too much to do. The cause of the bad state of the plant had its roots far back in the past. The exchange system which was taken over from the *Société générale* in 1889 was in poor condition. In anticipation of the termination of its concession the company had not tried to maintain its plant in a good state of efficiency. The telegraph administration on acquiring the system stimulated a considerable increase of traffic by reducing the flat rate from 600 to 400 francs, but it failed to introduce multiple switchboards in order to handle this increased traffic as it should have done. Instead, it introduced a system of making exchange connections which required the use of more than one operator to effect a single

¹ Sembat, Steeg; esp. latter at pages quoted above.

connection in case the party wanted was beyond the reach of the operator receiving the call. The result was that the poor service continued. As the number of subscribers increased the condition of the service became worse. Plans for reform were numerous, but the administration was unable to choose one of them and adhere to it. At first the plan was adopted of concentrating all the exchange offices under one roof, and a great central office at Gutenberg was constructed. The result of the concentration of lines in one building was to increase the expenses of construction, since the average length of line was increased and the scale of underground work was magnified. In 1894 this plan was modified and a number of exchanges were constructed on the periphery of the city. In 1900 a new method of effecting local connections was adopted. The work of answering calls was assigned to one set of operators and that of ringing up the party called for to another set, and communication between the two sets was established by telephone. The method is the same as that employed in the handling of long-distance calls. As the result of the greater pressure under which local business is carried on, this method of operation produced a great deal of confusion in the working of the exchange. The best device for overcoming the difficulties of exchange operation that arise as the size of an exchange system increases was known, even at the time the Paris system was acquired by the government, to be the multiple switchboard. Yet it was not until fourteen years later that an appropriation was made for the introduction of that method of operation.

The incompetence of the personnel made a bad matter worse. The operators were not employed in sufficient numbers nor given the special training that is indispensable for the proper conduct of the complex operations of a large exchange.

The crisis in the telephone business was only one aspect of a general postal crisis.¹ Throughout the French postal and telegraph

¹ *Compte rendu des travaux de la Chambre de Commerce de Paris; Année 1906.* Paris, 1907. *Report of the Commission on the Ways and Means of Communication*, pp. 346-350. The Chamber of Commerce voted, Dec. 26, 1906, that the postal and telegraphic department be informed of the damage that was occasioned to French industry and commerce by the lamentable condition of the postal and telephone services.

service the plant had been allowed to run down and the personnel had not been properly recruited. Throughout the entire service the supply of facilities, both material and personal, had failed to keep pace with the growth of the demand. The necessity of a thorough reorganization was plain. In the spring of 1906 the replacement of Rouvier by Sarrien at the head of the radical ministry afforded the opportunity for a reorganization. The Postal and Telegraph Department was transferred from the Ministry of Commerce and Industry to that of Public Works. The under-secretary in charge of the department was soon after succeeded by another who possessed in larger measure the confidence of the Chamber. The new administration decided that the telephone service could not be put on a sound basis without the more vigorous construction of main long-distance lines and the reconstruction of the Paris exchange system. The construction of new exchanges in the business district and the introduction of the common battery system of operation was declared to be urgent. A special law was enacted July, 1906, to provide the necessary funds. The same act also provided additional funds for the further construction of long-distance lines.

During the course of the same year the Minister of Finance granted the postal and telegraph authorities a special credit of 19,000,000 francs out of the loan authorized in that year on account of the Moroccan embroglio.¹ Thus Sembat's prophecy of 1903, like Millerand's of 1900, came true. The chambers of commerce had complained, and it had been necessary to make large appropriations suddenly. Extensive new works had to be undertaken without sufficient preliminary consideration and to be finished before the end of the year when the credit would lapse. If not finished, another year might see the special credits not renewed, and the unfinished works would never be completed. Such hurried work is always extravagant and often careless. The crisis of 1905-06 promised to be an expensive lesson for the country which had permitted its rulers to maintain an unwise policy of telephone finance. Whether or not the lesson would be worth the cost would depend on how well those in authority profited by it.

¹ Steeg, p. 1853.

It would seem that this crisis was destined to mark the turning-point towards a wiser policy in the conduct of the French telephone business. When the financial estimates for 1907 came up for discussion in the Chamber the new administration was compelled to reveal its plans.¹ The unsatisfactory condition of the service, both long-distance and local, was candidly admitted. Measures were already being taken to improve the efficiency of the personnel. In other respects the amelioration of existing conditions was declared to be a matter of funds and rested in the hands of Parliament itself. But Parliament, as well as the administrative authorities, had profited by the recent experience. The Limoges plan of financing the telephone business was not definitely abandoned, but was at least assigned a more modest place as a source of capital for fresh construction.

Meanwhile the commission on the budget for 1907 had been investigating the crisis independently. The nature of this investigation can best be gathered from the words of the reporter of the commission himself:² "Your *rapporteur*, wishing to learn the public needs otherwise than through casual and isolated complaints, addressed the chambers of commerce asking them what improvements they would like to see introduced into the general postal and telegraph service. It was suggested, however, that proposals of reform would be most useful which would not require an increase of expense." The unanimous reply from the chambers of commerce was that the government ought to provide the capital for the business from which it derived the profits. The chambers waxed ironical at the simplicity of the public financier who should expect to improve the service except by spending money. In their opinion the only remedy was for the central government to take the financial initiative out of the hands of the local authorities. If the government was unwilling to provide the money for the proper conduct of the telephone business, it should hand over the monopoly to those who would. Private enterprise would gladly accept the opportunity to invest capital with such a good

¹ Débats parl., Ch. des dép., 1906, p. 2854. Speech of Louis Barthou, Minister of Public Works, Dec. 3, 1906.

² Steeg, p. 1850.

prospect of a profit. The reporter of the commission concluded that the crisis was profound; that so long as the old methods of conducting the business were retained it would be recurrent; and that it could not be permanently cured without a radical reform of the financial policy of the government.

The freedom with which the government placed funds at the disposal of the telegraph administration in 1906 would seem to indicate that the lesson of the crisis had been taken to heart. The reporter of the commission on the postal and telegraph budget for 1908 was able to observe:¹ "As for the telephone one is glad to be able to get an imperfect service after having known an epoch when no connection at all was obtainable." The evil results of over ten years of starvation, however, could not be repaired in one year of abundance. In 1907 the chief of the telephone service confessed² that the main long-distance lines were still overloaded and unable to handle the business originating in the relatively better developed departmental toll lines. The personnel in some localities was still overworked. The appropriations of the year before had not been ample enough. He promised to ask for more for the coming year.

There was certainly every need of more capital. After the appropriations of 1906, the commission on the budget for that year had declared that increased appropriations were still needed in order to increase the number of employees, train them properly, and enlarge the fixed plant.³ That of the following year declared that, in addition to the further construction of long-distance lines and the reorganization of the exchange system at Paris, the exchange systems in the departments required the introduction of the following improvements:⁴

- (1) metallic circuits wherever single wires were then in use;
- (2) more modern subscribers' instruments;
- (3) the common-battery method of exchange operation;
- (4) multiple switchboards in all the larger exchange systems;

¹ Docs. parl., Ch. des dép., 1907; Annexe no. 1247, pp. 1906-1988. *Rapport sur le budget des postes*, etc., pour 1908, par M. Noulens, p. 1907.

² Débats parl., Ch. des dép., 1907, p. 2396. Speech of M. Simyan, Nov. 21, 1907.

³ Sembat II, p. 141.

⁴ Steeg, p. 1867.

- (5) the prolongation of night service; and
- (6) the installation of a greater number of public call offices.

These were changes which there was little prospect of bringing about on the scale which alone could enable the service to keep pace with the changing needs of its patrons, so long as the supply of capital was dependent on supplementary contributions from those who had borne the expense of initial construction. If ever a policy, mistakenly pursued long after its day of usefulness was past, failed to accomplish the purposes for which it was adopted, it was the French government's policy of raising the capital for carrying on its telephone business from its customers.¹

The deplorable state into which the French telephone industry had fallen cannot be ascribed, however, solely to the unfortunate financial policy of the government. There was no question of the incompetence of the officials to whom was intrusted the actual administration of the telephone undertaking.² The vacillating policy with regard to the construction of the exchange system at Paris, especially the long delay in deciding to introduce multiple switchboards and the failure to make more determined demands for increased appropriations, reveal the bad management and lack of enterprise of the telegraph authorities. Their business incapacity was further demonstrated by their inability to make the most of the scanty funds that were placed at their disposal. In 1904 an appropriation was made in order to purchase a quantity of electrical apparatus which the administration intended to use in order to detect more promptly the exact location of breaks in the long distance lines. The instruments were already in use in America and had demonstrated their worth. Yet their introduc-

¹ Unfortunately the French do not seem to have profited by their wretched experience as they should have done. The chambers of commerce were not relieved of the burden of financing fresh construction after the passage of the crisis. In 1907, as in former years, we find the chambers lending their credit to the government without compensation in order to secure the construction of necessary lines for which the telephone authorities could not or would not secure the funds from Parliament. Cf. Report of M. Pinguet on the construction of a third telephone line between Paris and Bordeaux. *Bulletin de la Chambre de Commerce de Paris*, 1907, p. 883.

² Cf. J. C. A. Prost: *La Crise postale française*, 1906, p. 56. *Rapport sur l'exercice pour l'année 1909*, par M. Chautard. Reported in *L'Action*, Nov. 23, 1908.

tion into France did not diminish the average length of the interruptions that resulted from accidental breaks in the line.¹

In every part of the world, in the early period of the telephone industry, telephone exchanges have been destroyed by fires caused by powerful currents that accidentally came in contact with the telephone lines and were so conducted into the exchange. In other places the recurrence of such catastrophes has been prevented by more careful construction and especially by the introduction of so-called lightning arresters. These are fuses inserted in the telephone line at the point where it enters the exchange. They are built to carry the weak telephone current easily, but melt at once and so break the circuit when a strong current passes along the line. The most important exchange at Paris, that at the Gutenberg office, was not provided with this device. One night in September, 1908, it was almost completely destroyed by fire, caused presumably by the entrance of a powerful current along the telephone wires, and the telephone service of the business portions of the metropolis was brought to a standstill. The telephone administration ascribed the cause of the disaster less to the lack of lightning arresters than to that of adequate supervision.² In either case, the result bears eloquent testimony to the incapacity of the administration.

¹ Steeg, p. 1868.

² Simyan in Ch. des dép., Nov. 6, 1908. Reported in *Le Matin*, Nov. 7, 1908.

CHAPTER XVII

THE RELATIONS BETWEEN THE TELEPHONE AND OTHER BRANCHES OF THE FRENCH ELECTRICAL INDUSTRY

IN France the development of the relations between the telephone and other branches of the electrical industry has taken a different turn from that in Germany and Switzerland. In the beginning, however, the attitude of the telegraph authorities towards power-circuit installations was the same.

The French decree of May 15, 1888,¹ required the promoters of power-circuit undertakings to give notice in advance of their plans to the prefect of the department in which the installation was to be made. Even plans for construction wholly within the bounds of private property were required to be declared to the police authorities, in case the current, if direct, exceeded 500 volts or, if alternating, 60 volts. The inductive effect of alternating currents is greater than that of the direct; hence the discrimination between the two. In general the rate of change of the force and direction of a current is more significant than its quantity, so far as concerns the phenomena of induction. Power-circuit conductors were required to be insulated where they crossed or passed within six meters of a telegraph or telephone wire. The use of earth to complete the circuit was absolutely prohibited. Finally, the supervision of such installations was intrusted to the telegraph administration.

The French decree of 1888, like the early legislation in the other countries, was issued with regard especially to electric-lighting undertakings. For several years it sufficed to furnish the telephone system with as much protection as the telegraph authorities desired without being particularly irksome to private enterprise. With the growth of electric street-railway undertakings further action became necessary. It was no longer possible to maintain the absolute prohibition against the use of grounded circuits

¹ A. P. T., 1894, pp. 257-260.

without depriving a great many localities of electric street railways which they would otherwise obtain. On the other hand the existing regulations were unnecessarily rigorous toward the less dangerous electric-lighting undertaking. The telegraph authorities became convinced that they could safely relax the conditions on which the latter installations might be made. At the same time they perceived that the relations between the telephone and electric street railway would have to be put on a less arbitrary basis than that of an administrative decree.

The electrical industry in France was conducted under entirely different conditions from those that prevailed in Germany and Switzerland. In France, as in Germany and Switzerland, the telegraph authorities from the first claimed the right to make use of the public ways for telegraphic purposes without obtaining the consent of the local authorities. But contrary to the event in Germany and Switzerland, the claims of the telegraph authorities were not for long allowed to remain doubtful. In 1885 the exercise of the similar claim in regard to the use of private property for telegraphic purposes led to a conflict of jurisdiction between the civil and the administrative courts. The telegraph authorities concluded that the best way to settle the controversy was to secure at once a positive act of Parliament confirming their claims. At the same time they determined to take advantage of the occasion to insure the validity of their claim to make use of the public ways. A bill with these objects in view was accordingly introduced into the Chamber of Deputies on February 9, 1885, and became law without important modification on the twenty-eighth of July.¹

Telegraph construction was declared to be a "public work" in the French legal sense of the term. Consequently the agents of the telegraph administration could enter upon and make use of private property even against the owner's wishes when armed with a warrant issued by the prefect of the department. The telegraph authorities were expressly authorized to execute over or under the public ways all works necessary for the construction and maintenance of telegraph lines. No compensation should be paid

¹ Vidal: *La Téléphonie au point de vue juridique*. Paris, 1886.

to the municipal authorities with the exception of a rental for lines *d'intérêt privé* which should be established in municipal sewers. This provision was inserted with regard to the special case of the city of Paris.

This sweeping grant of rights over municipal property to the telegraph authorities without compensation seems extraordinary in comparison with the German legislation on that subject. But it will be remembered that French municipalities do not stand in the same relation toward the central authorities as do the German. In France the municipalities possess less local self-government; the central authorities enjoy and are in the habit of exercising greater powers of intervention in local affairs. The consequence of this legislation of 1885 was that the French municipalities were in no such position as were those in Germany to play the part of protectors of the power-circuit branch of the electrical industry. Moreover, even if they had possessed the power and the habit of organized action of the German municipalities, they did not have the same pretext for taking part in the contest, because unlike their Teutonic neighbors to the northeast, the French municipalities displayed very little taste for a policy of municipal ownership.

In the few cities of importance where the local authorities have displayed an inclination to acquire and operate as a municipal monopoly any local business, their plans have been thwarted by the disapproval of the central authorities. The prefects, acting under instructions from the government at Paris, have almost invariably withheld their consent when the local authorities have requested them to sanction appropriations with a view to the conduct of business operations. Ordinarily such appropriations are disallowed on the ground that they are contrary to the law of March 17, 1791, which established the principle in France that all citizens should have liberty to engage in any lawful business or profession. When a municipal authority desired to engage in a business which, on account of its nature, could not be free to all, such as gas or electric-lighting or street-railway undertakings since these undertakings have to make use of the public ways, consent was refused on the ground that the power was not expressly con-

ferred by the municipal code of March 21, 1884, from which French municipal authorities derive all their powers. This attitude of the administrative authorities was confirmed by the administrative courts when cases were brought before them.¹ Hence, municipal ownership of public utilities does not exist in France on a scale at all comparable to that in Germany. The conflict between the telephone and the power-circuit branches of the electrical industry in France was one therefore in which the local authorities were destined to play no part.

There was another fundamental difference between the relations of the power-circuit to the telephone branch of the electro-technical industry in Germany and France. In the latter country the cost of construction of local telephone lines was defrayed by the telephone subscriber, not by the administration. The administration simply executed the orders of its patrons entirely at their expense. If they were dissatisfied with the quality of the service rendered by the single-wire telephone circuits with earth return, they were free to order their exchange system constructed on the basis of metallic circuits. The telephone administration simply raised its rates for the more expensive mode of construction and gave its patrons their choice.² If local subscribers whose service was rendered on the basis of grounded circuits complained of impaired audibility in consequence of the establishment of an electric-lighting or street-railway undertaking, the administration could reply that the mode of construction was defective, since it offered the subscriber no protection against the mutual induction of several telephone wires wherever they were thickly strung along the same line. Thus the cost of improving the local telephone

¹ The leading case is that of the funiculaire de Belleville, decided Feb. 24, 1887. Cf. Block: *Dict. de l'administration française*, 5th edit., 1905, Art. "Commune," vol. i, p. 659.

² *Tarifs tel.*, vol. ii, p. 86. In Austria, where until 1907 the method of charge for telephone exchange service was the same as in France except that the feature of local initiative was eliminated, the administration reserved the right to require any subscriber to have his line equipped with a metallic circuit whenever it should declare a metallic circuit to be necessary in order to protect the telephone service from the perturbing influence of a power-circuit conductor, and raised the subscriber's initial contribution towards the cost of construction of his line by 50% to cover the additional expense.

service in order to keep it abreast the march of progress in the electro-technical industry was shifted automatically to the consumers. The disadvantages of this policy have been pointed out in a former chapter. It suffices here to emphasize the fact that this development policy removed one source of conflict between the telephone administration and promoters of power-circuit electrical undertakings.

The derangement of the working of long-distance lines by neighboring power-circuit undertakings in France was even less likely to give rise to a conflict. Not only were the long-distance lines constructed by local initiative, but also the introduction of metallic circuits in order to enable them to work properly was recognized to be indispensable independently of the influence of neighboring currents of high potential. Hence their protection as well as that of the telegraph lines became a matter of preventing direct contact. This could be done without putting an excessive burden on the promoters of power-circuit undertakings.

Under these circumstances, the French telegraph authorities soon realized that the obligations which had been laid upon the promoters of such undertakings by the decree of 1888 were unnecessarily stringent. The expediency of modifying its dispositions was recognized at least as early as 1893.¹ In that year the administrative regulations forbidding the use of the earth to complete electrical circuits were relaxed on the national ways.² A project for a law which should supersede the decree of 1888 and establish a permanent basis for the relations that should prevail between the telephone and the other branches of the electrical industry, was introduced into the Chamber of Deputies in the spring of 1894.³ The electro-technical interests had become dissatisfied with the regulation of the industry by ministerial decree. The matter was too important for such summary treatment, but it was too complicated to be regulated in detail by act of Parliament. Parliament possessed neither the patience nor the requisite tech-

¹ A. P. T., 1894, pp. 257-260. *Die Herstellung von Starkstromanlagen in Frankreich*. Décret du 15 septembre, 1893.

² R. Sée: *Les Entreprises de distribution d'énergie électrique*. Legislation et jurisprudence, Paris, 1903, p. 190.

³ *Ibid.*, pp. 94-95.

nical knowledge for the proper execution of such a delicate task. Hence, in the committee of the Chamber of Deputies to which the telegraph administration's bill was referred, the parties most interested in the matter agreed to the creation of a special commission to which the protection of their respective interests should be intrusted. This commission was intended to determine their relations in detail along lines broadly laid down by Parliament itself. With this important modification the project passed the Chamber without debate in November, 1894, and the Senate in June, 1895.¹

The law of 1895 relaxed the police supervision over electrical installations erected solely on private property. Thereafter electrical installations which were not intended to utilize the public ways might be erected without the previous notification of the departmental prefects, provided they did not approach within ten meters of a telegraph or telephone wire. In that case notice was required to be given to the central police authorities for the district in question, who, in their turn, should notify the telegraph administration. The latter had three months in which to file their acceptance of or objections to the proposals. In the latter event, if no agreement could be subsequently reached by private negotiation between the telegraph administration and the promoters, the decision should be made by the minister in charge of the telegraph service with the advice and consent of an electrical commission. Alterations in undertakings which were already in existence at the date of the enactment of the law might be ordered within six months thereafter in the same way. Such alterations would then have to be completed within the ensuing twelve months. Private electrical installations which were intended to pass over or under the public ways were not to be constructed without the consent

¹ Loi concernant l'établissement des conducteurs d'énergie électrique autres que les conducteurs télégraphiques et téléphoniques du 25 juin, 1895; *Journal Officiel*, June 26, 1895. The text of the law was reprinted without comment in the next succeeding issues of the leading French electrical journals, *L'Électricien*, *L'Industrie Électrique*, and *Le Journal de l'électricité*. There is no evidence, either in the technical press or in the parliamentary debates, that the act was preceded by any such struggle as took place in Germany. In fact it seems to have been the result of an understanding between the two branches of the industry brought about by direct negotiations.

of the prefect of the department in which the ways were situated. He was authorized to determine what measures would be necessary for the protection of telegraph and telephone wires on the basis of a special report from a telegraph engineer and in accordance with the prescriptions of the Minister of Commerce, Industry, Posts and Telegraphs. These prescriptions, however, were not applicable to power-circuit installations promoted by public authorities or by private persons or associations acting under special governmental authorization.

The plans for such installations were required to be submitted in advance to the minister in charge of the telegraphs and telephones for his consideration. He was bound, however, to take and follow the advice of the electrical commission. This commission was a permanent body appointed by the minister and composed half of public officials and half of representatives of the great electro-technical industries.¹ The law of 1895 expressly stipulated, however, that all projects must be so carried out as not to disturb previously existing telegraph or telephone lines. Should the commission decide that the alteration or relocation of existing telephone lines was necessary, the expense should be borne by the promoters of the disturbing undertaking.

Since the commission was authorized to execute this provision by drawing up the appropriate regulations, it had the power to prevent the burdening of promoters of power-circuit undertakings with works for the protection of telephone lines that were in an unreasonably defective technical condition. On this point, there could be no serious antagonism of interest in the commission between the public officials and the representatives of the electro-technical industry, so far as exchange lines were concerned. The

¹ The present composition of this commission is determined by the law of June 15, 1906. It is composed of thirty members, fifteen representatives of the electro-technical industry appointed by the Minister of Public Works, Posts and Telegraphs, and fifteen officials appointed, three each, by the Ministers of Public Works, of the Interior, of War, and of Agriculture, respectively, and three appointed by the Minister of Public Works especially to represent the postal and telegraph branch of his department. (*Journal Officiel*, 1906, p. 5965). The technical conditions intended to protect the interests of the public in general and of the telegraph and telephone service in particular, as determined by this commission, are decreed by the Minister of Public Works and must be submitted to an annual revision.

adoption of metallic circuits at the cost of subscribers would not affect the ordinary exchange rates. The contributions of telephone subscribers towards the expense of construction were readjusted in order that the telephone administration could install metallic circuits when requested to do so without incurring any additional expense on its own account. The disadvantage of this arrangement lay in the fact that many subscribers either lacking in initiative, or impelled by motives of economy, would continue to tolerate a defective service rather than have a metallic circuit installed. The result would be a retardation of the transition to the more efficient style of construction and consequently an inferior standard of service. Hence, it is no cause for surprise that the commission on the budget for 1907 included, among other reforms, which it declared ought to be made at once, the completion of the introduction of metallic circuits in the provincial cities.¹

The law of 1895, like all legislation, failed to give permanent satisfaction in every respect. With the lapse of time its less happy features became more and more perceptible. In order that promoters of electrical undertakings might make use of public ways other than the great national highways, the consent of the departmental or municipal authorities was necessary. There was no difficulty in coming to mutually acceptable terms for the use of the public ways, so long as the promoters proposed to establish an undertaking with a view to the service of the territory over which the way-authorities exercised their jurisdiction. But when the progress of the electro-technical industry brought the era of the great central power stations from which electric current is distributed over a large area, a new difficulty arose. It often became necessary for promoters of great electrical schemes to obtain rights of way from local authorities to whom they proposed to render no service whatever, or at least none at all commensurate with the magnitude of their undertaking. The local authorities thus found themselves in exclusive control of a privilege the use of which was perhaps indispensable to the electrical promoters. Consequently, they were strongly tempted to "hold up" the applicants for rights of way until the latter should consent to pay

¹ Steeg, p. 1867.

a round sum for the privilege they desired. The yielding to this temptation by local authorities quickly brought about an intolerable state of affairs, and the central authorities were appealed to for the protection of the promoters.¹

The result was the law of June 15, 1906.² This law was passed by the deputies without debate under a declaration of urgency by the minister in charge, and like that of 1895 seems to have been the product of a preliminary understanding between the central authorities at Paris and the representatives of the electro-technical industry. The details need not be gone into in this connection. In the main, it followed the lines of the law of 1895. Its prime purpose, however, was not to make any alteration in the dispositions for the protection of telephone lines, but to facilitate the granting of concessions to promoters of electrical undertakings on a large scale, afford them security of tenure and relief from the exactions of local authorities, and, in general, to strengthen the control of the central authorities over the establishment and exploitation of electro-technical undertakings. With this object in view the Minister of Public Works, Posts and Telegraphs was authorized to fix the maximum fees which the local authorities might charge for the use of their public ways. The latter were, moreover, prohibited from making any stipulations concerning the commercial aspects of the exploitation of an electrical undertaking as a condition to the granting of a right of way. Complete control over the dispositions regulating the relations which should prevail between the promoters of such undertakings and the public was retained in the hands of the central authorities.

Regulations concerning the technical conditions of exploitation were to be made as under the law of 1895 with the advice and consent of a standing technical commission. The general dispositions of the law of 1906 for the protection of telegraph and telephone lines are identical with those of the law of 1895. Consequently the relations between the power-circuit and the telephone branches of the electro-technical industry remain on the basis established by the earlier law.

¹ R. Sée, *op. cit.*, pp. 11-45.

² Loi sur les distributions d'énergie électrique du 15 juin, 1906.

There is no evidence that the electro-technical interests are seriously dissatisfied with this arrangement. The French legislation purports to give the telegraph service the same protection as was accorded the German telegraph service by the German act of 1892. In practice its effect is radically different from that of the earlier German legislation. Nominally the entire French electro-technical industry is made tributary to the telegraphs and telephones. In fact, it does not feel its subjection. In default of unexpected developments in the realm of electrical science, the French scheme of a bi-partisan electro-technical commission ought to furnish a reasonably satisfactory mode of determining the questions which will fall within its competence.

The effect of the French legislation on the development of the electrical industry cannot be measured statistically with exactitude. The figures of comparative development in the leading European countries, however, are not un instructive. The electrical street railways are the electrical undertakings most likely to be adversely affected by the measures taken by the telegraph authorities to protect the public investment confided to their care. The development of electrical street railways at the end of the year 1895 was as follows:¹

Country.	Number of lines.			Length in kilometers.	
	Trolley systems.	Other systems.	Total.	January 1, 1896.	January 1, 1895.
Germany	35	1	36	406	102
France	11	5	16	132	41
United Kingdom	8	10	18	107	71
Switzerland	12	0	12	47	23
Italy	7	0	7	39	13
Austria-Hungary	6	3	9	71	33

Absolutely, the greatest development was in Germany; relatively to population, or to area, in Switzerland. In number of systems the United Kingdom was superior to France, but in length of lines it was inferior and was advancing less rapidly.

In all the countries the introduction of electricity as a motive power was retarded by the fact that a great deal of costly street-

¹ *L'Industrie Electrique*, March 10, 1896.

railway plant was already in existence, operated by other forms of power. In 1890 the use of animal power for traction purposes was dominant on the urban street railways of all countries, and where cheap water power for the generation of electrical current was not available, the preference in 1890 was for steam rather than for electricity, if any mechanical power were to be substituted for horses. This was especially the case on the suburban and local rural lines. In the then existing state of electro-technical science, the problem of the transmission of power over long distances was a formidable one. Fresh construction outside of the cities took the form chiefly of "feeders" for the ordinary steam railways. These feeders were intended to carry agricultural produce and other commodities as well as passengers and, though usually constructed on the highways, were of an entirely different nature from the urban street railways. Moreover, the traffic over these lines was not dense, a circumstance which diminished the advantage of the use of electrical power instead of steam. In France the total length of street-railway lines in 1890 was 1085 kilometers, and in 1895, 2167 kilometers.¹ Thus, the length of track in operation doubled during that period, a growth to be attributed almost wholly to the construction of local steam roads on the rural highways.

In the cities the substitution of electric for animal traction was retarded by the dread of the municipal authorities lest the bare trolley wires become sources of danger to life and property in the streets, especially in case of fire. This dread was not unreasonable, and, as Europeans display a far greater concern for the preservation of human life than do Americans, they were perfectly consistent in being more reluctant to permit the erection in the public ways of uninsulated wires charged with powerful electric currents. Hence, in Europe, especially in the largest cities, the use of steam was preferred for a time to that of electricity. Even after the introduction of electricity was seen to be more economical than that of steam, where traffic was dense and stops frequent, the municipal authorities still were tempted to wait in the hope that other forms of power transmission would be invented which could

¹ *Annuaire statistique pour l'année 1906*, p. 440.

be substituted for the trolley, or that the problem of electric traction would be solved by the use of storage batteries.¹ The cities which were already fairly well served by animal, steam, or cable street railways could afford to await the results of the experience gained by experimentation in the smaller and less well served cities. This was true not only in the big cities of Europe—London, Paris, and Berlin—but also in the American metropolis—New York. The Europeans, indeed, could better afford to use caution than could the Americans, for in the European capitals the greater compactness of the residential districts, and the more extensive omnibus and public-carriage services, left less need for the street railway than in America.

Thus there were many considerations besides the desire of the telegraph authorities to protect their undertakings from derangement by induction from neighboring trolley wires, which tended to restrict the early use of electrical traction especially in that form, on urban street railways in Europe. All these considerations, taken together, exercised a greater influence over the development of electrical street railways in France than in Germany and Switzerland, as is clearly shown by the statistics. But they did not exercise any more influence in France than in England, where at that time the telephone constituted a private monopoly in the hands of a private corporation—the National Telephone Company—and where consequently the public authorities had no incentive for according them special protection. Indeed, it can be shown that the private telephone company was able to obtain the issuance of regulations for the protection of its private interests no less effective than those decreed by any of the telegraph administrations on the Continent.²

¹ In 1895, according to E. Pilon: *Monopoles Communaux*, Caen, 1899, p. 258, 35 French cities possessed 37 street-railway systems. Of these, 16 were operated by animal power, 14 by electricity, 5 by steam, and 2 by compressed air. Lyons possessed both animal and steam traction, Saint Étienne steam and electricity. None of the cities of the first rank possessed electric traction. Paris, Marseilles, Bordeaux, Toulouse, Lille, and Rheims were still watching the results of the experiments that were being tried in the smaller cities.

² I have discussed the telephone situation in Great Britain in two articles published in the *Quarterly Journal of Economics*, November, 1906, and August, 1907. Only so much of the British experience with respect to the regulation of the relations

The British state telegraphs were protected by the electric lighting acts of 1882 and 1888. These acts gave the Postmaster General power so to regulate the conditions on which electrical lines might be constructed in the public ways as to provide that they should not injuriously affect the governmental telegraph lines, "or the telegraphic communications through any such line."¹ The same acts protect telegraphic lines owned by private persons, but not the communications through them. Under this legislation the National Telephone Company, which carried on the telephone business of the United Kingdom under a special license from the Postmaster General, had no protection against the promoters of other electrical undertakings which might interfere by means of induction with the proper working of the telephones. It sought to safeguard its investment, however, not by introducing metallic circuits but by the cheaper method of securing the insertion of a clause in all special legislation sought by the promoters of other electrical undertakings, by virtue of which the latter were forbidden to construct their works in such a manner as to interfere with the communications through the lines of the National Telephone Company.² In this it was almost uniformly successful, and at last, encouraged by its success, it ventured to approach the Board of Trade with a view to the adoption of a standard clause for insertion in all future private bills and provisional orders dealing with electric traction.³

between the telephone and the power-circuit branch of the electrical industry is set forth here as seems useful for the purpose of enabling the reader better to judge the policy pursued in France.

¹ Telegraphic lines include telephone lines according to the decision of the High Court of Justice, Dec. 20, 1880.

² *The Electrical Review*, May 26, 1893: Editorial, "Cheap Traction or Defective Telephones."

³ In Great Britain promoters of industrial undertakings which require special parliamentary powers may obtain them either by a special act or by a provisional order issued by the Board of Trade in accordance with a general act, such as the Tramways Act, 1870, or the Electric Lighting Act, 1888, and confirmed by Parliament in a so-called provisional orders confirmation act, in which a number of such orders are confirmed at once. In the former case the nature and extent of the powers to be granted are discussed and determined in a special private bill committee of Parliament; in the latter by the Board of Trade, subject to the confirmation (rarely refused) of Parliament. In either case those interests which will be affected by the

Against such a proceeding the electrical traction interests, although hitherto beaten in their contests with the telephone company, stoutly protested. Their cause was strengthened from a new quarter. On October 29, 1891, the first overhead trolley road in England was opened at Leeds.¹ This road was built by the municipal authorities themselves, and then leased for a year in order to be equipped experimentally with the Thomson-Houston system of electrical traction. Hitherto the Board of Trade, acting under the Electric Lighting Act, 1888, had invariably refused to sanction the erection of overhead trolley wires, except in special cases, and even then its sanction was made conditional on obtaining the consent of the local authorities. This condition had always proved an insuperable obstacle, "because public sentiment was against the overhead trolley on account of the sad accidents which had happened in America." But when a local authority itself applied for permission to introduce the overhead trolley, the Board of Trade did not deem itself justified in withholding its sanction. The telephone company promptly carried its objections before the courts, but as the lessee had special parliamentary authority for his conduct by virtue of his contract with the city of Leeds, the court had no difficulty in holding that he had acted within his rights.² The decision would also in all probability have gone the same way on the common law alone, and thus would have been in line with the American decisions.

This decision precipitated the desire of the telephone company to secure a parliamentary confirmation of its position towards the promoters of power-circuit undertakings. The events leading up to the decision in the Leeds case insured to the latter the proposed grant of powers are entitled to a special hearing before the Parliamentary Committee, or Board of Trade, at which they may present their objections. The issue between the parties is then decided much as in an ordinary case at law. If, as a result of such decisions, similar powers under like conditions are regularly granted to all applicants, the Board of Trade is accustomed to frame standard clauses, which are always thereafter inserted without discussion in all private bills and provisional orders dealing with the same subject. Cf. A. Lawrence Lowell, *The Government of England*, 1908, vol. i, chapter 20.

¹ *Elektrotechnische Zeitschrift*, 1891, p. 630.

² *National Tel. Co. v. Baker*, High Court of Justice, Chancery Div., Feb. 4, 1893 (English Law Rep., Chancery Div., June, 1893, p. 186).

port of the municipal authorities. The Board of Trade declined the responsibility, although it had the power of establishing a standard clause as desired by the telephone company, and turned to Parliament for advice. The result was the appointment of a joint committee of the two houses of Parliament "to consider and report whether the grant of subsequent powers to use electricity ought to be qualified by any prohibition or restriction as to earth-return circuits, or by any provisions as to leakage, induction, or similar matters, and if so in what cases and under what conditions." ¹

It is not necessary to go into the evidence given before the committee. Witnesses were heard and counsel argued on behalf of the railway companies, the electric lighting companies, the electric tramway companies, the municipal authorities, and even the gas and water companies. As a result of its deliberations the committee agreed on a clause to be inserted thereafter in all private bills and provisional orders which should be sought by the promoters of large electrical undertakings for any purpose except electric lighting. Its use in the operation of electric street railways was, of course, the purpose especially in view. The object of this clause was to establish permanent relations between telephones and tramways on the basis of the protection of each by its promoters at their own expense. The effect was to bring about the same relations as were established in the United States by virtue of the decision of the courts. The Board of Trade thereafter inserted the standard clause as determined by the joint committee in all special legislation dealing with the matters in question, and the telephone company accepted its defeat.

Until the middle of 1893, however, the telephone company in England had impeded the introduction of electrical traction certainly as much as did the telegraph administration in France. In both countries the use of the earth for the return of the current was prohibited to electric street railway promoters for a period of several years. In both countries the prohibition was removed; in England by the advice of a joint committee of Parliament, and

¹ Report from the Joint Committee on Electric Powers (Protective Clauses), House of Lords, *Sessional Papers*, 1893-94, vol. 10.

in France by decision of the telegraph administration itself, at about the same time. In England the decision of the committee did not require the sanction of an act of Parliament, nor in France did that of the telegraph administration. In the latter country the desire to establish the relations between the different branches of the electrical industry on a more stable foundation for the future led to legislation in 1895. In England in that year the use of other forms of power transmission than the overhead trolley was relatively more extensive than in France, a fact which, so far as it indicates anything at all, indicates that the policy of the National Telephone Company had been more effective in retarding the growth of the industry by requiring the employment of a more costly method of power transmission than had that of the French telegraph administration. But in the face of the other influences that had affected the situation the difference is too trivial to be of much significance.

It may be objected that the policy of the National Telephone Company was only possible because of mistaken legislation in regard to the electrical industry on the part of Parliament. It may be so; in any case, the early correction of that mistake was greatly facilitated by the existence of the policy of municipal ownership of electrical undertakings in the British cities. If the practice of municipal ownership of public utilities obtained in France, as it does in Great Britain, Germany, and Switzerland, it is unlikely that the relations between the telephone and the other branches of the electrical industry would be considered permanently determined, so long as they were dependent upon the deliberations of a bi-partisan commission in which the representatives of both of the parties are finally appointed by one of them. Only the unimpeachable exercise of its right of appointment by the government prevents the system from becoming intolerable.¹

The early French policy was the policy of all the European telegraph administrations in the earlier period of the electrical industry. The methods employed to safeguard the public under-

¹ At the risk of anticipating unduly the results of later chapters, convenience has determined the inclusion at this point of cognate material relating to several other continental countries.

takings were more or less rigorous according to the character of government in the various countries and the extent of their industrial development. In Italy and Hungary, for example, the attitude of the administrative authorities was expressly sanctioned by positive legislation. The Hungarian law of August 8, 1888,¹ provided that electrical installations of all sorts should be so erected as not to interfere with the operation of telephone systems, and, in order to make this requirement effectual, that plans for such installations should be submitted in advance to the minister of public works for his approval. His decision in regard to the dispositions that should be made in order to protect the telephone should be final. The Italian law of April 7, 1893,² to provide for the proper regulation of the telephone business, required that promoters of electrical undertakings should submit their project in advance to the approval of the Minister of Posts and Telegraphs. The concessionnaire of a project ought to take all possible precautions at his own expense to prevent the injury of the telephones by more powerful currents. The use of metallic circuits was prescribed for the power-circuit undertakings, and that of the ground in any way for the return circuit was prohibited. Any damages whatsoever to the telephone should be compensated for by the concessionnaire of the disturbing undertaking. The minister was authorized to decide what measures were necessary for the protection of the telephones and to order the removal, or even to annul the concession, of any undertaking that threatened to exercise an unfavorable influence over the operations of the telephones.

The later French policy with regard to the relations between the telephone and the other branches of the electrical industry has not been without imitators. The Italians and Hungarians, to be sure, have maintained their original legislation. The Norwegians, however, have introduced the French scheme of a permanent electro-technical commission by their law of November 16, 1896.³ This law provides for the appointment by the Crown of a commission of three members, of whom one must not be an official, to

¹ A. P. T., 1888, pp. 497-500.

² Executed by decree of June 24, 1892. A. P. T., 1893, pp. 16-17.

³ *Zeitschrift für Kleinbahnwesen*, 1899, p. 288.

make all needful regulations to govern the relations between the various branches of the industry.

Some novel features in the solution of this problem are presented by the legislation in the Netherlands.¹ In that country the existence of municipal authorities in the double capacity of promoters of both power-circuit and telephone undertakings has lent a different aspect to the inevitable encounter between the two sorts of installations. In accordance with the law of January 11, 1904, the Minister of Navigation and Dike Construction, Commerce and Industry, framed and issued the regulations, governing the two branches of the industry. The general basis of his regulations was laid down in the law itself, and was much the same as that established by the German law of 1892. In some respects it goes further than that law. The owners of a telephone service, for example, may prohibit absolutely the construction of a proposed electrical undertaking employing a power of over 500 volts, in case it is not possible to relocate existing telephone lines which would be injuriously affected by such an installation. This provision would appear to give the municipal telephone authorities a dangerous amount of protection against electrical railway undertakings but for the fact that its application is considerably affected by the ownership of these undertakings by the municipalities themselves. Thus the three largest Dutch cities, Amsterdam, Rotterdam, and the Hague, not only own their telephones but also own their electric street railways. Consequently they cannot abuse their powers under the act of 1904 without injuring themselves. In other words, where a little municipal ownership could have been dangerous, a good deal is safe.

¹ A. P. T., 1905, pp. 700-705: "Das neue Niederländische Telegraphen- und Fernsprechesetz und die dazu erlassenen Ausführungsbestimmungen, betreffend den Schutz der Schwachstromanlagen gegen die Starkstromanlagen."

CHAPTER XVIII

THE RATE-POLICY OF THE FRENCH TELEPHONE ADMINISTRATION

THE rates of the French telephone administration have never been the objects of such battles as were fought over the German and Swiss rates. The French were more fortunate in their beginning. The early rates of the *Société générale* were so high that there was no excuse for their imitation by the public authorities. Moreover the system of financing telephone construction which was adopted by the French authorities threw into another form a considerable part of the charge, which, in Germany and on the system of the *Société générale*, was comprised in the ordinary flat rates. Hence when the French telephone administration first established its charges in medium-sized cities, it fixed them on a far lower level than that maintained in the larger cities where the private company was in control of the business. Upon the acquisition of the company's system by the government, the flat rate in Paris was cut to two thirds of its former amount and those in the provincial cities reduced correspondingly. Yet even after these changes there was a considerable difference between the charges in large and in small places. The French telephone administration quickly realized its original mistake in reducing the rates as the number of subscribers to an exchange system increased, and in 1889 framed its schedule on the opposite principle. Thus the governmental telephone monopoly was launched with a schedule of rates which was tolerably well adapted to the different conditions that prevailed in large and in small exchange systems.

The French telephone authorities began in 1889 by offering the same variety of service that was to be found in the neighboring countries at that period.¹ The flat rate was fixed at 400 francs in Paris, 300 francs in Lyons, 200 francs in the larger provincial cities (those with more than 25,000 inhabitants), and 150 francs

¹ *Tarifs tél.*, vol. 1, pp. 39-44.

in the others. Taking into account the contributions toward cost of construction, these rates were all much higher than the German and Swiss flat rates. Supplementary stations, that is, all but the first station to be connected with an exchange by the same line, were charged for at the rate of 160 francs at Paris, and 120 francs elsewhere. If both principal and supplementary stations were to be used exclusively by the same subscriber, the rates were reduced to 50 and 40 francs respectively. The requisite apparatus was paid for separately when it was installed. All subscribers were permitted to use public call-offices freely without further charge. Non-subscribers were required to pay 50 centimes per talk, or could secure the unlimited use of all public call-offices for a year for 80 francs in Paris, 60 francs in Lyons, and 40 francs elsewhere. Subscribers could obtain the unlimited use of all toll lines in a group of exchange systems in the same district upon payment of an addition of 50% to the annual exchange rate. If there were no exchange in a locality, a private resident or the local public authority could become a subscriber to the inter-urban service for 50 francs a year and pay in addition the ordinary toll rates on all outgoing talks. This was a useful rate at that time, since there were many small villages without an exchange system which enjoyed access to a departmental toll system. The long-distance message rates were 50 centimes per 100 kilometers or fraction thereof for each period of five minutes.

No general movement among telephone subscribers or any class of them against the principle of these rates can be traced in the published reports of Parliament. During the discussion of the annual estimates of the postal and telegraph administration contained in the budget, there was usually more or less scattering criticism of particular rates, but this criticism represented the particular feelings of single individuals or localities. No concerted attack on the rates was made by any organized party. The capacity of the chambers of commerce for concerted action was greatly diminished by their lack of a central organization. Disunited, they were in no position to make a consistent attack on the rate-policy of the telephone administration. In practice the telephone authorities seem to have relied for the necessary information on which to

guide their conduct in regard to rates upon the reports of the several chambers of commerce and the specific complaints of local authorities or private individuals. The authorities have the power to fix the rates by decree, but changes that can affect the public revenue must be submitted to Parliament for approval along with the next annual estimates.¹ In practice changes are always arranged by the minister in charge of the postal and telegraph service in accord with the minister of finance, and are never permitted to imperil the public revenues. Hence Parliament has never as yet interfered with the conduct of the ministers in regard to rates.

The first changes were actually made in 1895.² The unlimited free use of public call-offices by subscribers was abolished on account of the inconvenience of identification. The rates on supplementary stations used by others than the proprietor of the principal station were reduced to the level of those on supplementary stations used solely by the proprietor of the principal station. The local message rate from public call-offices was reduced from 50 to 25 centimes, and the toll rate on inter-urban conversations was likewise cut in halves. At the same time the unit period of a talk was reduced from five to three minutes. The practice of giving unlimited district connections at a flat rate was abandoned. This last change called forth the protestations of the interests that were adversely affected, and a few years later the district flat rate was restored.³ The toll rate for communications throughout the extent of any one department was fixed at 40 centimes, or 25 centimes for talks over not more than 25 kilometers of lines. For inter-departmental messages the rate was fixed at 25 centimes per 75 kilometers or fraction thereof, with the proviso that no charge for a single talk should be less than 40 centimes, nor more than 3 francs for any distance. The night rates were fixed at three fifths of the day rates, or, in case a contract was made for the same connection regularly at the same hour, at two thirds of the day rates.

The local exchange rates in the smaller places were also modified during this period.⁴ The nature of the change was the intro-

¹ Loi du 21 mars, 1878, art. 2.

² Décret du 30 août; *Journal Officiel*, 1895, p. 5405.

³ Décret du 29 déc., 1898; *Journal Officiel*, 1899, p. 14.

⁴ A. P. T., 1901, pp. 290-326; *Das Fernsprechwesen in Frankreich*.

duction of the message as the basis of charge. The obstacles to the employment of measured-service rates in France were lessened by the fact that the subscriber bought his own instrument and paid for his own line. Hence the chief difficulty did not lie in determining the rate itself but in recording the number of messages. In consequence of this difficulty the message rate for subscribers' service was introduced at first (1897) only in cities with less than 60,000 inhabitants. Its reception by the public was so favorable that it was soon extended to cities with not more than 80,000 inhabitants. The effect was to make the new rate available in the great majority of the exchange areas of France, although not at that time to a majority of the telephone subscribers in the country. The telephone subscribers in the places where the message rates went into effect were given the option of paying the old flat rate or of paying 15 centimes per local call. At the same time the public call-office rate was reduced to the same amount. But it was necessary to secure from message-rate subscribers a contribution towards the general operating expenses apart from those which varied with the number of calls. Otherwise they would have been unduly favored at the expense of the flat-rate subscribers. Hence they were charged in addition to the fee per call a fixed sum of 100 francs the first year their line was in use. This charge was successively reduced the following years to 80, 60, and 40 francs respectively, and remained fixed at the latter amount for the fourth and all succeeding years. Supplementary stations attached to the lines of message-rate subscribers were entitled to the same service for 30 francs a year.

The principle of this measured service was borrowed from the Swiss, who had established their rates on that basis in 1889 and adhered to it at the revision of 1894.¹ These rates were very attractive to small users. A subscriber to a direct line in a place with more than 25,000 inhabitants would find it advantageous to take the measured rather than the unlimited service so long as he did not send more than 1000 messages a year. After the introduction of message rates the increase of flat-rate subscribers, outside of

¹ *Bundesrätliche Botschaft zum Gesetzentwurf über das Telephonwesen*; Bundesblatt, 1888, iv. Cf. Part II, ch. xii.

Paris and the other large cities in which flat rates were alone permitted, was very slow. From 14,227 at the end of 1897, the number of such subscribers rose only to 16,758 at the end of 1902. During the same interval the number of message-rate subscribers increased from 3924 to 25,557.¹ The demonstration of the utility of measured-service rates could not be clearer.

Another change which was made during this period related to the rates for talks between large cities and their suburbs.² At first telephone subscribers in the suburbs within 25 kilometers of the center of the urban district were accorded unlimited 'service throughout the entire urban and suburban area on payment of the flat rate in force in the urban area, plus a special fee of 10 francs per kilometer of line required to connect the urban and suburban "centrals." The effect of this arrangement was to make the suburban exchange rate higher than the urban. Those suburban subscribers who desired only a local service felt that this elevated charge was exorbitant, and demanded the establishment of a reduced local exchange rate in connection with a toll rate on talks between city and suburb. The telephone administration accordingly abandoned the former and adopted the latter method of charge (1895). These changes were vexatious to those suburban subscribers who used the telephone chiefly for the purpose of communicating with the city. At last, in 1897, in order to reconcile the two opposed parties the telephone authorities adopted the sensible course of offering suburban subscribers their choice between both kinds of service. These suburban rates were of importance chiefly in the metropolitan area of which Paris is the center. Elsewhere the French suburban population is of comparatively little significance.

The great problem in connection with the telephone rates in France has not been to secure their diversification in order to bring them into accord with the divergent needs of different localities or classes of subscribers, but to secure their reduction to a reasonable level. When account is taken of the contributions made by subscribers to the cost of construction, even the lowest rates adopted

¹ Lacombrade, p. 294.

² A. P. T., 1901, pp. 290-328; *Das Fernsprechwesen in Frankreich*.

by the administration in 1889 for the smallest class of exchange were higher than the single flat rate in Germany. The flat rates in force in the larger places — in Lyons and especially in Paris — were much higher. Their discrepancy cannot be explained away by reference to any differences in the general level of prices, or in any other economic differences between the two countries, for no such differences exist on a scale at all corresponding to the differences in rates.

As early as 1895 the excessive height of the French rates was allowed to be inferred by the declaration of the telephone authorities themselves. The minister in charge of the telephone service in that year, A. Lebon, publicly stated that the development of the telephone service was arrested by the elevation of the rates.¹ It would be impossible, he continued, with the existing facilities, to reduce the flat rates, and moreover such a reduction might disturb the budgetary equilibrium. Five years later Lebon's statement was confirmed by Millerand's positive declaration. The flat rates in Paris and Lyons, he asserted, should be reduced from 400 to 300 francs a year and from 300 to 250 francs respectively.² But such a reduction was then impossible on account of the lack of adequate facilities for accommodating the increase of traffic that would result. In other words, as he himself said, the existing exorbitant rates acted as a "dike" against an inconveniently rapid increase of subscribers and, exorbitant as they were, would have to be maintained for that express purpose until more ample facilities should be available.

Between the stupid financial policy of the French government and the business incapacity of the telephone management, adequate facilities were not made available, and the "dike" was maintained. To be sure, Millerand accomplished some minor reforms.³ Among others, he reduced the local message rate from public pay stations in Paris from 20 to 15 centimes, and in the de-

¹ Rapport au Président de la République française du 30 août, 1895; *Journal Officiel*, 1895, p. 5405.

² Millerand Rapport, p. 3000; cf. *ante*, ch. xi.

³ A. P. T., 1902: Reform des Fernsprechgebührenwesens in Frankreich, pp. 376 ff., 404 ff. These reforms were accomplished by the decree of May 7, 1901. Cf. also, *Tarifs tél.*, vol. II, pp. 182-198.

partments from 15 to 10 centimes. The contributions towards the cost of construction of subscribers' lines were also reduced, as they had come to exceed the actual cost to the administration of the materials and labor employed in that work. Message-rate subscribers thereafter received their instruments free, as well as their lines up to a distance of one kilometer from the exchange office. In places where the message-rate service was not available, it was made permissible to rent special lines to be used only for long-distance service at a flat rate of 150 francs a year in Paris, 125 francs in Lyons, and 50 francs elsewhere. This service met the needs of those who did not care for a local exchange service yet made considerable use of the long-distance lines. Flat-rate subscriptions were furthermore admitted for shorter periods than a year and made payable quarterly, or even monthly. But the main reform, promised for the end of 1902, was postponed.

The facilities which Millerand declared should be ready by the end of that year were not ready. Nor were they ready the next year, nor the next. Meanwhile the "dike" was still maintained. Then the crisis came. The commission on the budget for 1906 pointed out that during the years that had elapsed since the publication of Millerand's report the excess of telephone receipts over the official estimates incorporated by the Minister of Finance in his annual budgets had alone amounted to more than enough to have so reconstructed the Paris telephone system that the reduction of the flat rate could have been made.¹ But the public fisc absorbed all the excess, the unexpected as well as that on which it had calculated. Still the Paris service remained unimproved. The commission on the budget for 1907 recognized that the flat rate could not be reduced for an indefinite period, and suggested that it would be better, perhaps, not to reduce it at all, but to introduce message rates instead.² This proposal had already been brought forward in the Chamber of Deputies by its promoters, but awakened no general response from the deputies as a whole.³ The telephone administration asserted that the introduction of mes-

¹ Sembat I, Introduction, pp. 1388-1389.

² Steeg, p. 1867.

³ Débats parl., Ch. des dép.; speeches of M. Chastenet, March 17, Dec. 3, 1906, *Journal Officiel*, 1906, pp. 1394, 2395.

sage rates had been under consideration, but the changes could not be put into effect in the large cities until the invention of a reliable means of counting calls.¹

A year later, on a similar occasion, the under-secretary in charge of the postal and telegraph department declared that the flat rate was unquestionably excessive, and that message rates should be instituted. The reform of the rates could not be made, however, until eight new exchange offices were constructed and the change to the common-battery method of operation was completed.² Finally, after another year, the destruction of the main Paris exchange by fire gave the reduction of the local rates to a reasonable basis another setback. Under-secretary Simyan then stated that plans were under consideration for the installation of new apparatus which would make possible the introduction of reasonable rates on the basis of a measured service.³ "But the reduction of the flat rate before the completion of the new exchange offices would stimulate an increase of patronage, to which we should not be able to give satisfaction." The "dike" still held fast.

Between incompetent management and a mistaken financial policy, telephone subscribers have had ample cause for dissatisfaction with the governmental service. It is, moreover, at least questionable whether the government itself has not also had cause to be dissatisfied with its conduct of affairs. Regarded simply as a source of public revenue, it is not at all impossible that the net receipts of the public treasury from the telephone business would have been greater had it been content with the 10 % of the gross receipts which it formerly received from the *Société générale des téléphones*. By converting the telephone service into a fiscal monopoly the government secured for itself the entire amount of the profits of operation, but at the same time its conduct of affairs unquestionably retarded to a very considerable extent the normal development of the business.

¹ Steeg, p. 1867.

² Débats parl., Ch. des dép., M. Simyan in reply to a question, Nov. 21, 1907; Journal Officiel, 1907, p. 2395. Cf. *Bulletin de la Chambre de Commerce de Paris*, 1907, p. 883.

³ *Ibid.*, Nov. 6, 1908. Reported in *Le Matin*, Nov. 7, 1908. Cf. Rapport sur l'exercice pour l'année 1909 par M. Chautard. Reported in *L'Action*, Nov. 23, 1908.

During recent years, up to the outbreak of the crisis, the operating ratio of the entire postal and telegraph undertaking has fluctuated around 75 %.¹ In other words, almost one quarter of the gross receipts have been covered into the public treasury as surpluses over and above current operating expenditures and have been available for use in relief of other forms of taxation. It is impossible to ascertain the share of the telephone service alone in the results of the whole undertaking, for the expenditures are not accounted for separately under each branch of the service. Hence no separate statement for the telephone business is published, and under the existing mode of accounting none can be published. But the gross receipts from telephone operation are known. These receipts in the year 1906, including therein the advances of local authorities on account of fresh construction, were materially less than those from the operation of the telegraphs. In the same year in Germany the receipts from the telephones were more than two and one half times as great as those from the telegraphs.² So far as the ratio between telegraph and telephone receipts in Germany is an indication of that which should have existed in France, the inference is that either the French telephone business has been stunted in its development or that the telegraph business has been exceptionally favored. Doubtless the constant overcrowding of the long-distance telephone service caused a portion of the long-distance traffic to be sent over the telegraph wires which would preferably have been sent by telephone; but there is also good reason for supposing that a certain amount of traffic never came into existence at all which would have been called forth by an attractive long-distance service. Hence, so far as that branch of the telephone business is concerned, both inferences appear well founded.

The effect of the business methods pursued by the French government on the profits of the local business is more difficult to calculate. The total receipts from the telephone undertaking, of which by far the greater part came from the exchange business, after the deduction of the sums repaid on advances by local author-

¹ Sembat II, p. 129.

² Bureau international des administrations télégraphiques. *Statistique générale . . . pour l'année 1906.*

ities, amounted to 127,360,321 francs for the period 1889 to 1901.¹ This sum, apparently, is slightly in excess of the sum of the original loan from the *Caisse des dépôts et des consignations*, plus the sums voted by Parliament in the annual budgets. But accuracy is out of the question, since neither receipts nor expenditures are separately accounted for. During the same period the government had acquired for nothing a plant originally equal in value to the amount of the advances by local authorities that had been repaid up to the end of 1901. This amount was more than 10 % of the gross receipts from operation, but meanwhile the plant so received had depreciated more or less. In the absence of proper accounts its real value in 1901 is a matter of guesswork. It may have been 10 % of the gross receipts from operation. In that case the French government had lost nothing financially by its change of policy in 1889, provided that the exchange business had grown as rapidly under governmental ownership as it would have done if it had remained under private management. In Paris, and to a lesser extent in the larger provincial cities, it had not done this. In the smaller cities the ill effects of administrative inefficiency were much less, and the advantages of the policy of 1889 over that of 1879 were much greater, than in the metropolis. But even so, as late as 1902 almost half of the whole number of telephones in use in France were to be found in the two cities of Paris and Lyons. What the proportion might have been under a more enlightened conduct of affairs it is impossible even to guess. In short, the fact remains that bad management had done its worst at the very point where mistakes were most costly. Hence the surplus of receipts over expenditures in the telephone service may easily have been actually less than the sum the French fisc might have received by farming the business to a private operating company.

In any event the surplus actually received is more apparent than real. For no account is taken of the interest and amortization of the capital invested in postal and telegraphic plant. Moreover, no account is taken of the services rendered the postal administration by the railroads nominally without charge or at less

¹ Cf. the computations of Lacombrade, appendix.

than cost. Under the arrangements existing in France between the government and the railroads these services are in reality paid for in other ways, and should be charged against the postal administration. On the other hand, the post office carries a great deal of official correspondence for other departments and transmits official telegrams over its telegraph wires without charge. In short, the true state of the French postal and telegraph finances is absolutely unknown. That under the existing schedule of rates the telephone branch of the undertaking is operated at a profit is, however, beyond question. But that this profit is as great as that which could have been realized by a more enlightened policy in the conduct of the business is open to grave doubts.

CHAPTER XIX

THE LABOR SITUATION IN THE FRENCH TELEPHONE SERVICE

IN France, as in Germany, the most significant facts in recent economic history are an increasing concentration of capital and a corresponding agglomeration of labor and strengthening of class consciousness among wage-earners. The latter phenomenon, the one most directly connected with the relations between public employees and the state, has, however, appeared in somewhat different form in France and in Germany. Neither the political nor the economic expression of workmen's class consciousness has attained the same development among the Romance working-classes as among the Teutonic.

The first point of difference is the numerical inferiority of the independent working-class movement in France as compared with Germany. The number of votes cast for socialistic candidates for the Chamber of Deputies in 1906 was 896,000,¹ or less than thirty per cent of the number cast at the German elections to the Reichstag in 1907. Allowing for the difference in population between the two countries, the socialist party is at least twice as strong in Germany as in France. The number of French trades-unionists in 1906 was 836,134,² or only half the number of the German workmen that were then organized in the socialist trade-unions alone. Thus the economic expression of the French working-class consciousness was relatively more highly developed than the political, but still far behind the German.

There are two principal causes of this contrast. In the first place, the factory system of industry is less highly developed in France than in Germany.³ Since both socialism and trade-unionism are primarily products of the factory system of industry, the greater

¹ W. Sombart, *Der Sozialismus und die Soziale Bewegung*, p. 263.

² Sombart, p. 266.

³ Comparative statistics of the industrial development of the various countries are contained in M. Bourguin, *Les Systèmes socialistes et l'Évolution économique*, 3rd edit., Paris, 1907, Annexe I.

development of that form of industrial organization in Germany must furnish a more powerful stimulus to the growth of the wage-earners' class consciousness than would be the case in France.

The second principal cause lies in the temperamental differences of the Teutonic and Romance peoples. The French working-classes display a greater attachment to abstract principles than the German or English or American, but less capacity to lay aside minor differences of opinion in order to work together for objects on which all are agreed. The French workman cannot forget the great revolution of the eighteenth century, and, though disappointed in the result, he prefers to risk all his hopes for the improvement of his lot on a fresh revolution, rather than undertake the slower and more laborious task of reforming the existing society in his interest from within. The work of building up an organization of wage-earners to secure a distant advantage at the expense of present sacrifice is less to the French wage-earners' taste than to that of German or English wage-earners. One of the latter class is reported to have remarked at an early laborers' international congress: "When it is a question of voting resolutions our French friends are always ready to put their hands in the air, but when they should put them in their pockets, it is another story."¹

In France the workmen's associations tend to assume a personal form. The brilliant exponent of ideals can gain a passionate following, whereas the mere methodical organizer, the leader who would put measures above men, finds only indifference or neglect. Thus the history of the socialist movement in France since the Commune is a history of discordant factions and personal feuds. Under the banner of the Blanquists were rallied the violent revolutionists who survived the Commune. The Marxians were organized under the independent banner of Jules Guesdes as soon as he dared return to the scene of his former activities. Soon the Opportunists (*Possibilistes*) "bolted" under the leadership of Paul Brousse and Benoit Malon. Finally, after the collapse of the Boulanger affair, the Allemanists (so named from their leader, Allemane) seceded from the Broussists. Nor do these exhaust the list of factions. Not until 1905, under the masterly leader-

¹ Quoted by Sombart, p. 265.

ship of Jaurès, were these inharmonious elements welded into a coherent mass. Even then the result was accomplished only after the exclusion of the revisionist Millerand from the ranks of the party; and the important group of so-called radical-socialists (a name which denotes, not a radical socialist, but a socialistic radical) remained entirely without the fold.

The effect of this subdivision of the political movement of the working-classes upon the relations between the state and its employees is unmistakable. The public employees have never acted as a unit at the polls, and if they had, the disintegration of parties in the French Parliament would have rendered their efforts of little avail. On the other hand, the minister at the head of the postal and telegraph services has enjoyed an almost unchallenged authority over his subordinates. Thus the means of expression of the working-class consciousness — despite the democratic form of government in France — have been no more effective in that country than in Germany. But if from the point of view of an independent and united working-class movement the subdivision of parties and the arbitrary authority vested in the so-called responsible ministers have been unfortunate, these political practices are not without some compensating advantages. Like all political habits, they have their roots deep in the past politics of the country. France, long an autocratic monarchy, suddenly in 1789 ceased to be autocratic. This sudden change in the political organization of the country, like most sudden changes, was made too hastily to give permanent satisfaction. During the ensuing century, a slow process of readjustment was necessary until the political institutions should reach a position where they would synchronize with tolerable accuracy the political aspirations and the political capacity of the French people. Such a state of political equilibrium appears to have been realized under the Third Republic. But like all political institutions, those of modern France are not ideal. They represent a compromise between the powers of the age that is past and the powers of the age that is to be. The particular form of this compromise in contemporary France is the combination of the legislature of a democracy with the executive of a despotism.

This political situation has had an important connection with the relation between the state employer and its employees. It has prevented the employees from exercising an important influence upon the determination of their own conditions of employment. Neither through political nor through economic action have they ever been able materially to alter their economic situation. Their collective will has been powerless. But this same political situation has made it possible for a socialistically inclined minister to do a great deal to alter the condition of the public employees. Such a minister was Millerand during the years 1899-1902.

Millerand was not an extreme socialist. He did not owe his office to socialist support. The fact that he accepted office in an anti-collectivist cabinet did not please his socialist comrades. His refusal to resign his office caused the disruption of the socialist party; and his conduct in office led to his ultimate expulsion from the socialist fellowship. Yet untimely interrupted as his ministerial career proved to be, Millerand did not resume his member's seat in the Chamber of Deputies until he had wrought changes in the conditions of employment in the service of the state that no successor has yet been able to ignore. By virtue of the enormous discretionary authority of the individual French cabinet minister and in spite of his employees, rather than with their aid, Millerand introduced into France the principle that the state employer shall be a model employer.¹

Millerand's solicitude was exercised particularly for the laborers.² He began his reforms cautiously. First, he tentatively introduced the eight-hour day in certain postal workshops.³ Then he extended it to other shops.⁴ He also inserted in all contracts for the construction of public works the conditions of employment that he wished to establish as a standard in all such work.⁵ These "model-clauses" provided for a weekly day of rest for all workmen employed under such contracts, fixed a limit to the proportion of alien labor that might be employed, established a nor-

¹ Cf. Paul Louis: *L'Ouvrier devant l'État*, p. 339.

² The lower grades of clerks were not badly treated, even according to his socialistic standards, under his predecessors.

³ Decree of Sept. 16, 1899.

⁴ Decrees of Feb. 3, and Jan. 15, 1901.

⁵ Decree of Aug. 10, 1899.

mal wage to be paid according to the rate current in the locality where the work was to be performed, and limited the hours of labor to the number customary in the locality.¹ It hardly needs to be added that he granted equally favorable terms of employment to the laborers employed directly by his department.² By a series of decrees, he gave them security of tenure, an eight-hour day, a weekly day of rest without loss of pay (*i. e.*, they were paid a salary, so to speak, instead of daily wages), and a classified schedule of employments, with maximum and minimum rates of wages in each class and fixed rules for advancement. He introduced extra payment for over-time work, and for work at night granted a corresponding reduction of the work of the next day. In case of illness, the workman was entitled to full pay for three months, and half-pay for three months more. Finally four per cent of the wage was held back for an old-age pension, to which the government added an equal amount. Laborers who could not be promised permanent employment when engaged were assured of a permanent engagement after two years' satisfactory service provided their services were continuously required during that period. In any case they were entitled to the same hours of labor and days of rest as the permanent employees.

Millerand's activity did not stop with the imposition of a minimum wage and of permanency of tenure on the lowest grades among his employees. He also took the first step towards their admission to a voice in the determination of their terms of employment. This first step towards a *rapprochement* between state employer and employee consisted in directing the local division chiefs to inform the employees in regard to their standing in the official records.³ This policy of taking the employees into the confidence of the state employer was carried further by Barthou, when

¹ In order to determine the customary rate, the department would accept the rate, if any, fixed by collective agreement between employers and wage-earners in the locality. If there should be no such rate, it would take the advice of both parties.

² Block: *Dict. des Finances*, 5th edit., 1905, pp. 2420-2421. A. P. T., 1907, pp. 89-91.

³ Circular of Nov. 30, 1900. This administrative regulation was confirmed by Parliament by Art. 65 of the financial law of April 22, 1905, and extended to all branches of the government service.

he became the head of the postal and telegraph service in 1906. Barthou reorganized the administrative council in the postal department and provided for the attendance of representatives of the employees to witness the impartiality of proceedings in relation to promotions.¹ Promotions are not made strictly according to seniority, but merit also is taken into consideration. The adoption of this method of making promotions not only received the approval of the associations of the employees, but had been recommended by them.²

The commission on the postal budget for 1907 recommended that the employees be represented by elected delegates on all administrative commissions affecting their interests.³ This recommendation, like most such recommendations in France, was ignored by Parliament. Perhaps in no respect has French governmental procrastination had more unfortunate consequences than in this neglect to promote the development of more intimate relations between the state employer and its employees, for it afforded the malcontents, who are usually to be found in any large body of employees, a pretext for advocating the resort to radical tactics. Impatient at the ill success which had greeted independent political efforts, the leaders of the French working-class movement had begun to preach that peculiar course of tactics known as *syndicalisme*. The story of this economic phase of the movement can be best understood after a digression concerning the origin and development of the French trade-union movement in general.

The revolution of 1789 swept away, along with the other medieval institutions that had long outlived their usefulness, the guilds of handicraftsmen. Under the influence of the reaction against association of all kinds which dominated the revolutionary leaders, the national assembly did not stop at the abolition of all the privileged corporations of the past, but also attempted to establish individual liberty in economic affairs for all time to come. With this object in view, a series of laws was enacted, June 14 to

¹ Decree of June 9, 1906.

² *Débats parl.*, Ch. des dép. Speech of M. Barthou, Dec. 3, 1906. *Journal Officiel*, 1906, p. 2850.

³ Steeg, p. 1871.

17, 1791, absolutely forbidding professional associations among the members of a trade for the purpose of promoting common interests by collective action. This result of the revolution was perpetuated throughout the greater part of the nineteenth century by the *Code Napoléon*. In 1864 Napoleon the Third granted laborers the right to combine for the purpose of obtaining an increase of wages (which implied the right to strike) but for no other purpose. Long before this, even before the promulgation of the *Code Napoléon*, a reaction had set in against compulsory liberty, and associations of employers had been formed under the toleration of the government. The same toleration could not be consistently withheld from the associations of workingmen, and under the third Napoleon not a few trade-unions sprang into existence under the sufferance of the government. Such a precarious existence, however, could not fail to cause much discontent, and in 1884 the government took the decisive step of legalizing the associations, both of employers and of wage-earners, for purely professional or trade purposes.¹

The law of 1884, however, did not expressly grant the right of association to employees of the state. Whether or not the grant was made by implication became a controverted question. In 1894, the Casimir Perier Ministry refused to recognize the application of the law of 1884 to the government railroad employees, and was forced to resign by a hostile vote in the chamber.² Yet the most widely accepted opinion has always been that the law of 1884 did not apply to governmental employees. In 1899 Millebrand, then Minister of Industry, Commerce, Posts, and Telegraphs in the cabinet of Waldeck-Rousseau, introduced a bill into the chamber to legalize the formation of trade-unions among the employees of the state. The bill was not then acted upon, and Millerand introduced it again in 1902, after he had become once more an ordinary deputy. A committee was appointed to investigate the matter, and under the chairmanship of Louis Barthou (who became Minister of Public Works, Posts, and Telegraphs in 1906) reported in favor of the extension of the provisions of the

¹ Loi du 21 mars, 1884.

² Débats parl., Ch. des dép. Séance du 22 mai, 1894.

law of 1884 to certain classes of governmental employees.¹ It recommended that a distinction be made between employees who hold any portion of administrative power and those who do not. The former, being political officials, it was argued, should be wholly subject to the orders of the head of the state. But the latter, whose relation with the public authority was a purely economic one, should have the same rights as employees of private business men. As the matter then stood, in the opinion of the members of the Barthou commission a strike on the part of any public servants would undoubtedly be a criminal offense.² This state of affairs seemed excessively rigorous. No action was taken in Parliament upon this report, however, and it appeared to have been forgotten, until in 1905 the question was brought once more by a combination of circumstances before the attention of the chamber and of the government.

Although the associations of governmental employees had no legal standing as trade-unions, a number of such associations were formed at the end of the nineteenth century and during the early years of the twentieth. Associations for any other purpose than *de partager des bénéfices* could be freely formed under the law of associations of July 1, 1901. This law finally swept away all the old restrictions upon the freedom of association which had been created in 1791 and perpetuated by the *Code Napoléon*. In accord-

¹ *Rapport sur les modifications à apporter à la loi de 1884*, par M. Barthou; Session Extraordinaire de 1903; Docs. parl. no. 1418. Four years later Barthou, as a member of the cabinet of Clémenceau, in reply to a question in the Chamber of Deputies, completely disavowed the recommendations reported by Barthou, the simple deputy of 1903. (*Journal Officiel*, 1907, Ch. des Dép., p. 915.) This incident is an illuminating commentary on the nature of French parliamentary politics. The distinction which Barthou had originally proposed to make was between "les fonctions de l'autorité et les fonctions de la gestion." Barthou's argument in 1903 was that the state employer ought to submit to all the conditions and legal obligations to which private employers are subjected with respect to those whom they employ. Accordingly the right to combine (which included the right to strike) should be granted to all employees of the state, "qui ne détiennent aucune portion de la puissance publique." Cf. Art. 5 of the bill reported by the Barthou Committee in 1903.

² In accordance with art. 226 (1) of the Penal Code. This article reads:—"Seront coupables de forfaiture et punis de dégradation civique, les fonctionnaires publics qui auront, par délibération, arrêté de donner des démissions dont l'objet ou l'effet serait d'empêcher ou de suspendre soit l'administration de la justice, soit l'accomplissement d'un service quelconque."

ance with its provisions governmental employees could form associations freely except for professional or trade purposes,¹ and a number of such associations were actually organized between 1901 and 1903.² Besides these associations, which clearly had no legal standing as trade-unions, a number of true trade-unions had been already formed among government employees with the more or less gracious tolerance of the heads of the departments concerned. Some ministers actually encouraged their subordinates to organize. Thus Millerand in 1899 encouraged the formation of a union of postal, telegraph, and telephone laborers, which counted 2000 members within a few weeks. In the following year he encouraged the formation of the General Association of Postal and Telegraph Clerks, which counted 5500 members within six months. There was also a union of the telegraph and telephone linemen.³ Similar unions were organized in a number of other governmental departments, although no other minister seems actually to have encouraged the movement. Some ministers, on the contrary, tried to discourage the organizations within their departments. For example, the President of the Council, Combes, dissolved the unions of road laborers in 1903, and in the following year the Minister of Finance ordered the dissolution of the customs officials' association.⁴ Thus a situation grew up with respect to unions of public employees which was in nowise different from that with respect to unions of private employees before the passage of the law of 1884, except that public employees could under no circumstances lawfully strike. Clearly such a situation could not con-

¹ Professor Barthélemy, author of a well-known *Traité du droit administratif*, writing in *Le Temps* (Jan. 27, 1906: "La Crise du fonctionnairisme"), stated that freedom of association for professional purposes was not extended by the law of 1901 to those who were not given that right by the law of 1884. Consequently, since 1901, governmental employees have been able freely to form social, or literary, or religious associations, but have no more been able to combine for the purpose of striking than before 1901.

² For an account of all the associations of governmental employees organized under the law of 1901, cf. a series of articles entitled "Les Fonctionnaires et leurs groupements corporatifs," in the *Revue Bleue*, June 3 to August 26, 1905, by G. Cahen.

³ Barthou Report, 1903, p. 53.

⁴ *Ibid.*, p. 51.

⁵ Maxime Leroy: *Le transformation de la puissance publique — Les Syndicats des fonctionnaires*. Paris, 1907, p. 203.

tinue indefinitely. It was necessary either that the power of the government be asserted and applied uniformly throughout the service, or that the claims of the associations be recognized.

The crisis came in 1905.¹ In the spring of that year the Minister of Finance forbade the organization of an association among the customs officials, and at the same time dismissed the president and another officer of the Association of Internal Revenue Officials. The immediate result (April, 1905) was the formation of the *Fédération générale des associations professionnelles des employés civils de l'état*. The number of members rose to 90,000 in a few weeks, and for the time being this event riveted the attention of the entire country upon the grievances of the public servants. The suddenness of the outburst was terrifying to persons whose notions of the public service were founded solely on the literary recollections of the *ancien régime*. The federation, however, by no means included all the organized employees of the state. It was loosely organized and seems to have sprung into existence solely as a protest against the intolerant attitude of the government of the day. After the first outburst of protest had spent its force, it yielded docilely to official pressure and abandoned its militant attitude.

A more serious problem was raised by a general spirit of discontent among the workmen in the arsenals of the navy department. On several occasions local strikes occurred and were vigorously repressed. The situation was particularly serious because the workmen in the arsenals were infected with the revolutionary trade-unionism, which, under the name of syndicalism, has in recent years gained the upper hand in the French trade-union movement. The cardinal doctrine in the creed of the syndicalists is the *action directe*; that is, the belief in the general strike as the most effective weapon for promoting the interests of the working-classes, together with a disbelief in the efficacy of political action. Some of the more radical of the leaders of the syndicalists carry their disbelief in political action so far as to avow

¹ Cf. the above work of M. Leroy; also, the same: *Le droit des fonctionnaires*, 1906; and J. Paul-Boncour: *Les syndicats de fonctionnaires*, 1906. The literature on the subject is already voluminous.

hostility to the republic, and threaten to call a general strike, whenever the republic shall become involved in a foreign war. These "anti-militarists" and "anti-patriots" constitute such a danger to the Republic on the one side as the Royalists do on the other.

The President of the Council, Rouvier, who succeeded Combes in the spring of 1905, declared in the Chamber of Deputies that he would never tolerate the assumed right to strike on the part of workmen in the arsenals.¹ Rouvier declared that the proposal made by Barthou in 1903 to extend the right to strike to employees of the state who were not *détenteurs d'une parcelle de la puissance publique* was too broad. It would be necessary also to exclude from the right to strike all employees connected in any way with the national defense.² One of the socialist deputies observed in reply that the connection between the arsenals and the national defense was no more intimate than that between the railroads (both state and private) and the national defense. But the right to strike was not denied to the railroad employees.³ Under the pressure of political conditions, however, the government was supported by a majority, and not only the right of governmental employees connected with the national defense, but of all others to strike in time of peace, remained unrecognized.

Rouvier's other argument for the denial of the right to strike was that the governmental employees had their proper representation in the Parliament.⁴ As citizens they were entitled to that, and as employees of the state they were not entitled to more. Consequently he refused absolutely to recognize the employees' associations, although he continued the policy of tolerating them. The actual position of the employees of the state was shortly after-

¹ Débats parl., Ch. des dép., Nov. 7, 17, and 18, 1905. See esp. *Journal Officiel*, at pp. 3080 and 3348.

² The same argument was advanced by Camille Pelletan, former Minister of Marine, who had put down a strike in an arsenal during his term of office. "Je ne pouvais établir aucune assimilation entre les ouvriers de l'industrie privée et les ouvriers de la défense nationale." Débats parl., Ch. des dép., Nov. 17, 1905, *Journal Officiel*, p. 3351.

³ Marcel Sembat, Nov. 17, 1905.

⁴ "La représentation nationale est l'organisme de conciliation entre les employés de l'État et les ministres détenteurs du pouvoir." Cf. Steeg, pp. 1869-1873.

wards neatly epitomized by the following quotation from an article published in *Le Temps*:¹ "Governmental employees are persons who have voluntarily alienated a part of their liberty. They are bound to maintain a certain reserve towards the government which they have solicited the honor to serve. They have always one means of expressing their opinion: the ballot."

Why it should be necessary for a person who "solicits the honor" of serving the government in the capacity of telephone lineman, for example, to surrender a part of his liberty is a question which a great many such persons now began to ask themselves. The employees had no influence over Parliament, and could not apply labor's ordinary weapon in conflicts with capital without rendering themselves liable to prosecution as criminals.

The government's policy simply demoralized the employees. The source of danger did not lie in any alleged lack of generosity in the treatment by the government of its employees, for whether compared with analogous employments in private industry or with the public service in other countries, the material conditions of employment in the French postal and telegraph service were good. It lay in the mischievous spirit which had been planted in the service by the uncertainties of the legal position of the employees, and fostered by the further uncertainty produced by the suspicion that the good of the service had too often been sacrificed under political pressure for private ends. The "spoils system," as it is known in the United States, has never gained a foothold in France, but a strong feeling had grown up that the interference of politicians in the conduct of departmental affairs, especially in regard to promotions, had become too frequent to be compatible with the reward of effort according to merit, and so with the true interests of the employees and of the public service. Under the existing relations between state employer and employees, the latter possessed no recognized and effective vehicle for the expression of their grievances. The result was to bring on among the employees what the commission on the budget in 1907 described as a *crise morale*.

In the same year, Clémenceau, the President of the Council,

¹ *Le Temps*, Aug. 24, 1905.

introduced a bill to make lawful the formation of trade-unions among the employees of the state under the following restrictions:

(1) only employees of the same department or business undertaking (*régie*) may belong to the same association;

(2) they may not combine except to promote their own interests;¹

(3) though complaints may be laid before the head of the department, any employee inciting another by word or threat to strike is liable to imprisonment.

This bill was to apply only to civil employees, and was intended, according to the preamble, to give to such public employees the rights that belong to all citizens, while reserving to the government the control needful in order to insure the proper conduct of public affairs.² The bill apparently satisfied nobody, and as late as the beginning of 1909 no action had been taken with regard to it. The government blindly followed its habitual policy of procrastination, notwithstanding the fact that it was impossible to be cognizant of the demoralization that prevailed in the service and believe that the existing situation could indefinitely endure without change.³

¹ That is, the unions should have no connection with one another nor with the general federation of unions, the *Confédération générale du travail*, which at that time was under the control of the revolutionary wing of the trade-union movement.

² Docs. parl., Ch. des dép., 1907, Annexe No. 833.

³ The strikes of the postal, telegraph and telephone employees of March and May, 1909, and of the railroad employees of October, 1910, are matters of recent history which fall outside of the limits of the present discussion. Apparently, the Briand ministry, as reorganized in November, 1910, will make a serious attempt to place the relations between the state and its employees on a satisfactory basis.

PART IV

PUBLIC OWNERSHIP OF TELEPHONES IN SOME OTHER COUNTRIES ON THE CONTINENT OF EUROPE

CHAPTER XX

THE PROMOTION OF TELEPHONE UNDERTAKINGS BY PRIVATE ENTERPRISE IN BELGIUM, HOLLAND, AUSTRIA, HUNGARY, AND ITALY¹

THE same reasons which led the French telegraph authorities to decline the responsibility for the conduct of initial experiments with the telephone induced most of the other telegraph administrations of Continental Europe to do likewise. All failed to perceive any close relation between the new invention and the telegraph service which they were charged to carry on, and preferred to await developments before committing themselves to any definite policy. The only way to do this with safety was to grant limited concessions to private speculators. This they uniformly did.

I. BELGIUM

The history of the introduction of the telephone into Belgium closely resembles that of its introduction into France. The tele-

¹ For the early history of the telephone on the Continent of Europe outside of Germany, Switzerland, and France, I have had recourse to secondary sources of information. All European legislation concerning the telephone has been reprinted in the *Journal Télégraphique* (cited as J. T.), the organ of the International Telegraph Bureau at Berne. Notices of the same and comment, besides many special articles of value, have been printed in the *Archiv für Post und Telegraphie* (cited as A. P. T.), the official publication of the German Imperial postal and telegraph administration. Further information is contained in the contemporary scientific periodicals, of which by far the most important is the *Elektrotechnische Zeitschrift* (cited as E. T. Z.), the standard organ of the German electrotechnical industry. Recently (since 1906) a special publication, devoted to the interests of the telephone and allied industries, has appeared, the *Zeitschrift für Schwachstromtechnik*. Books dealing with the telephone from any except the purely technical standpoint are scarce. J. Brault: *Le Téléphone en 1888. Histoire de la téléphonie et exploitation des téléphones en France et à l'étranger* (Paris, 1888) is wholly uncritical. A. R. Bennett: *The Telephone Systems of the Continent of Europe* (London, 1895) contains a valuable collection of material in relation to mutual and coöperative telephony and the small local private systems of a similar nature, which flourished in the Scandinavian countries in the early days of telephony. Bennett's book unfortunately was written to prove the expediency of encouraging the establishment of mutual telephone systems in England, and is marred by a bias that too often warps the author's judgment.

graph was a public monopoly in Belgium as in France. The first experiments with the Bell telephone in the former country were made in 1878. The government was unable to discern a want in the telegraph service that the telephone could supply, and declined to introduce it into the public telegraph system. In 1879 a telephone company was formed in Brussels to undertake the exploitation of the invention. This company established exchanges in a few of the larger industrial cities and equipped a number of manufacturing plants with telephonic signal systems. The government granted concessions for the operation of exchange systems to all who applied for them. A number of companies quickly entered the field, and in some of the more important cities vigorous competition sprang up.¹

The state of affairs that ensued is thus described by the Belgian Minister of railways, post offices and telegraphs, Van den Peere, in a speech in the Chamber of Deputies in 1885:² —

"In Brussels there were three competing companies. The confusion between the lines was so great that when an interruption of service occurred it was not unusual to see representatives of all three companies hastening to the locality of the interruption, none of whom knew to which company the line belonged that had caused the mischief; and owners of buildings on which lines were erected did not know which company should bear the blame for the damage to their property."

In order to put an end to the intolerable inconveniences of unrestricted competition, the public authorities encouraged the various companies to amalgamate. The result was the formation of the *Compagnie belge des téléphones Bell* in 1882.³ Then, since the theory of free competition had broken down, the public authorities set about the task of properly regulating the conduct of the telephone business.

By the law of June 11, 1883, the telephone business was declared to be within the scope of the public telegraph monopoly.⁴ At the

¹ Brault, p. 165.

² Belgique, Chambre des députés, séance du 7 juillet, 1885. Procès-verbal.

³ E. T. Z., 1893, p. 31.

⁴ Loi concernant l'établissement et l'exploitation de réseaux téléphoniques du 11 juin, 1883.

same time provision was made for the granting of concessions which would enable private enterprise to carry on the local exchange business. The conditions of these concessions were fixed in advance in a *cahier des charges* which accompanied the law. Concessions would be granted for the conduct of exchange operations in stipulated local areas for a period of twenty-five years. At their expiration the plant of the concessionnaires should revert to the government free of charge. Throughout the period of concession the concessionnaires should pay the government a compensation of five francs per telephone station in operation. The government reserved the right of canceling the concessions and purchasing the plant of the concessionnaires after ten years. In case it should exercise this reserved right it bound itself to pay the actual value of the plant, as determined by experts, plus a compensation for compulsory purchase based on the average net profit of the three preceding years plus an additional 15 % of the sum so determined.

The *cahier des charges* does not make it clear just what was meant by "actual value." This might be the value as a going concern, or the cost of replacement, or the original cost of the plant less depreciation (this is most likely); or even, though improbably, merely the value of the material in the plant for purposes of reconstruction. However, this ambiguity was not serious, as the machinery was provided for settling any disputes that might arise on that score. On the whole, these concessions were well devised, and were much superior to those issued in France.

Several such concessions were at once granted and exchange operations in the leading cities conducted in accordance with their terms. Provision was made for the connection of exchange systems with the public telegraph system in order to facilitate the transmission of inter-urban messages and their more rapid delivery, by a combination of the two services. In 1884 the state began the construction of long-distance telephone lines in order to improve the inter-urban service, the first line being established between Brussels, the capital of the kingdom, and Antwerp, its chief commercial center.¹

¹ A. P. T., 1887, p. 137.

In 1886 the public authorities became dissatisfied with the disposition displayed by the concessionnaires to confine their operations to the larger and presumably more remunerative centers. It consequently determined itself to supply the service in the places of lesser importance and to grant no more concessions to private enterprise. This decision foreshadowed the exercise by the Government of its option of purchase, as soon as the first ten years of operation under the concession of 1883 should expire. The private companies, of which there were four in existence in 1890, attempted to secure the reversal of this policy of public ownership,¹ but without success. January 1, 1893, the telephone systems of the Bell interests were taken over by the state, and the others were secured as soon as the terms of their concessions permitted.² By 1896 there were no private telephone exchanges in Belgium.³

II. HOLLAND

In Holland the telegraph was a public monopoly by virtue of the law of March 7, 1852. When the telephone appeared on the scene the telegraph authorities assumed it to be within the scope of their telegraph monopoly, but announced their decision to grant concessions for a limited period for the establishment of exchange systems. A number of concessions were soon issued, of which those for the most important cities were secured by the *Nederlandsche Bell Telefoon Maatschappij*.⁴ This company was formed in 1881 to take over the rights previously held by the International Bell Telephone Company of New York. Contrary to the practice of the other telegraph authorities, which handed over the task of constructing exchange systems to private companies, the Dutch also permitted their concessionnaires to establish inter-urban telephone lines. These lines were built under a special license in accordance with which they could be purchased by the government at the expiration of the license, September 30, 1897, at the cost of construction.⁵

¹ A. P. T., 1890, p. 189; 1892, Art., "Das Telegraphenwesen in Holland und Belgien," pp. 1-22, 36-49, 83-90.

² E. T. Z., 1893, p. 31.

³ J. T., 1898, *Statistique générale des téléphones*.

⁴ A. P. T., 1892, Art. cited above. Cf. Brault, p. 114.

⁵ A. P. T., 1887, p. 718.

The result was that in a country of such narrow limits as Holland the effect of the competition of the telephone with the telegraph was quickly apparent. It became more and more serious as the telephone systems expanded. By the time the licenses of the long-distance lines expired in 1897, the telegraph authorities were only too glad to re-take that part of the telephone business into their own hands.¹ The deficits on the operation of the telegraphs, however, which had begun long before the introduction of the telephone, and had been increased by the subsequent competition of the latter, have continued.

The telegraph authorities still did not care to undertake the local exchange business. The short-sighted business methods of the private companies, particularly of the Bell Company, in the big commercial centers, had aroused however a spirit of discontent. Telephone subscribers felt that they had no protection against exorbitant charges, nor assurance of efficient service, and demanded municipal ownership of telephones. The telegraph authorities were not loth to let the municipalities relieve them of the task of guarding the interests of local users, and so the municipal authorities in many places have taken the exchange business into their own hands.²

In 1894 the Bell Telephone Company operated sixteen exchange systems in Holland, including the systems in Amsterdam, Rotterdam, the Hague, and the other leading cities. Ten years later it operated nineteen, but none in cities of the first rank.³ In both Amsterdam and Rotterdam the disaffection with the service was so great that the city authorities refused even to purchase the company's plant on expiration of the local concessions. Instead, they built entirely new systems which were ready to be opened on the day after the termination of the concessions, October 30, 1896.⁴ The company was forced to tear down its plant and throw on the scrap heap so much of it as could not be used again elsewhere. The Hague opened a municipal system in 1903, whereupon the

¹ *Ibid.*, 1889, p. 899.

² *Municipal Affairs*, vol. iv, p. 24: "Municipal Telephones in Amsterdam."

³ *Tarifs tél.* vols. i and ii, p. 78 and pp. 246-57, respectively.

⁴ *Report of the Chamber of Commerce at Amsterdam for the year 1896*, p. 45.

Bell voluntarily withdrew. In all, twenty-two municipalities were operating their own exchanges in 1904. During the decade from 1894 to 1904 the total number of local exchanges increased from thirty-three to sixty. Thus municipal ownership of telephones has made more headway than private ownership. The prevailing tendency at present still is for the former to gain ground over the latter.¹

Some indication of the comparative performances of municipal and private telephone undertakings in Holland is afforded by a discussion of the question of telephone rates. In Amsterdam and Rotterdam the Bell rate in force in 1894 was approximately \$47.20, taking the gulden as worth 40 cents, for a direct line with unlimited service.² That seems to have been the only rate and the only service that the company offered. A decade later, under municipal management, the charges had been greatly reduced and the service classified on the basis of business and residential subscriptions.³ The former was approximately \$36, the latter \$26.40, a reduction of 24% to business subscribers and of 42% to residential subscribers. In the Hague the substitution of municipal for private ownership was followed by a reduction from \$46 to \$26. In the thirteen smaller places in which the Bell carried on an exchange business in 1894, the single flat rate was approximately \$24. Ten years later the rate in the nineteen small places in which the Bell at that time was conducting an exchange business was \$16. At the earlier date the rates in force in the similar small places, where the exchange systems were in the hands of other companies than the Bell, ranged from \$12 to \$18. In 1904 these rates were unchanged.

The connection between the change of policy and the change of rates is incontestable. The result of municipal ownership in the Netherlands has been a greater reduction of rates than has occurred during the same period of telephone development in any part of Europe except in France, where private enterprise was also

¹ I am indebted for much information concerning municipal telephones in the Netherlands to the kindness of some of the municipal telephone authorities, especially to Mr. E. J. Kist, director of the municipal telephone service at Rotterdam.

² *Tarifs tél.* vol. i, pp. 77-79.

³ *Tarifs tél.* vol. ii, pp. 246-257.

succeeded by public ownership. There is, of course, no comparison with the rates in places that have never been supplied with telephone service except by the public authorities, because the latter were able to establish their rates at the beginning on a more reasonable level than were the private companies. The experience of the Dutch municipalities simply serves to corroborate the lesson taught by the experience of France. Any community that employs private enterprise to relieve it of the initial risk in the introduction of a new service, must pay a price for the relief it has secured, in case the venture proves a success. Such a payment is not only unavoidable in practice, but the underlying principle is without question fair.

Whether the actual price which the Dutch municipalities were called upon to pay was reasonable or unreasonable is a more dubious question. A company doing business under a special concession is lawfully entitled to as great a profit as it can make, provided that it keeps within the terms of its concession. If this profit proves to be unexpectedly large, it is nevertheless a legitimate consequence of the conditions under which the risk of the original contract was assumed by the respective parties — the promoter of the venture and the public authorities. To be sure, public authorities are not always wise in the making of such contracts, and grant concessions under conditions which never ought to be granted, but that is not a reason for condemning the promoter who takes advantage of the circumstance. A promoter, however, who wishes to be intrusted with the exclusive management of an undertaking of general public importance, must recognize that he holds a public trust. It is wise policy, in the long run, and perhaps also a source of satisfaction for individuals or corporations with local associations, to render good service to the community which bestows such a trust. That the Netherlands Bell Telephone Company, in the earlier portion of its history, displayed a flagrant disregard of public opinion, is made evident by the fact that the authorities at Amsterdam and Rotterdam refused to have any dealings with it at the expiration of the local concessions. In thus disregarding public opinion, the managers of the Netherlands Bell Telephone Company showed a con-

siderable amount of business incapacity, for which they paid the penalty. The possibility of such business incapacity is one of the factors which must always be reckoned with when the administration of such a business as the telephone is handed over for any considerable period to a private monopolist.

By the adoption of the policy of municipal ownership, the Dutch municipalities seemed to have accomplished the object which they had in view. Those municipalities which took the telephone business out of the hands of the private companies demonstrated their ability to reduce the rates. Those municipalities which chose to adhere to the old policy of granting special concessions were able to take advantage of the success of the municipal telephone undertakings and compel their concessionnaires to make similar reductions of rates, or forfeit their concessions at their expiration. The character of the service has not deteriorated under municipal ownership; on the contrary, it has improved, especially in the larger cities where improvement was most needed. The directors of a municipal telephone service manage their undertaking on the same principle as they would a municipal water supply. They make the service as good as they can, and then assume that those citizens who care to participate in its benefits will do so voluntarily. There is no advertising, nor canvassing for new business, as in ordinary private businesses. The managers concentrate all their resources in the effort to give as satisfactory a service as possible. In the three largest Dutch cities the service is tendered by the most up-to-date equipment. The Hague installed common battery switchboards with incandescent lamp signals in 1903, Amsterdam in 1906, and Rotterdam in 1907. The method of charge in 1907 was still the flat rate for an unlimited service, but the introduction of measured-service rates was already under consideration, and was to be put into effect in Rotterdam after the reconstruction of the exchange office was finished. All the municipal undertakings were being operated on a sound financial basis, and fresh capital was furnished as fast as required by the municipal authorities.

The drawback to the municipal ownership of telephones, as it exists in Holland, is that the limits of municipal areas do not cor-

respond with those of the most desirable exchange areas. Each municipal undertaking enjoys a monopoly of exchange operation within the limits of a circle with a radius of five kilometers circumscribed about the center of the municipality. This arbitrary delimitation of the exchange area often excludes persons from participation in the benefits of a given exchange system whose wants cannot be so satisfactorily met by an exchange system situated in any other area. Others are included in a municipal exchange area who reside outside the municipal limits and are not infrequently charged higher rates than are the citizens of the municipality which owns the exchange system in that area. These are evils, however, which result, not from the fact of municipal ownership, but from the attempt to divide the administration of the telephone business between the central and the local authorities. The essence of such a division is the creation of more or less arbitrary limits to the competency of the local authorities. In such a business as the telephone where, above all else, it is the annihilation of all spatial barriers that is desired, such division of responsibility for the conduct of the business and such restriction of the authority of the various local managements is certain to cause friction and dissatisfaction. Moreover, these restrictions prevent the administration of the service as a whole in the best interests of all its parts. The policy of municipal ownership has the advantage of utilizing local initiative to its fullest extent. It sacrifices, on the other hand, the even greater advantages that are derived in the telephone business from the centralization of management. This drawback, however, is not the result of the principle of public ownership, but of the particular form of business organization which the public authorities in Holland have adopted.

III. AUSTRIA

The telephone was first introduced into Austria in 1879 by the war department, in order to facilitate the transmission of orders at the great military post of Cracow.¹ The first telephone exchange was established in Vienna in 1881 by a private company, to which a concession had been granted by the telegraph author-

¹ Brault, p. 160.

ities. No more concessions were applied for until 1883. Then several were granted for a number of the more important commercial centers. In 1886 the question of the construction of long-distance lines arose, and the telegraph authorities decided to do that themselves. In the following year they established their first local exchange.¹

The reasons for this change of policy on the part of the telegraph authorities were, partly that the companies owning the original concessions restricted their operations to the greater commercial centers and declined to extend the service to medium-sized places without more favorable concessions, and partly that the telegraph authorities themselves were encouraged by the success of the private companies and were now willing to undertake the business on their own account.² At the time they came to this decision the concessionnaires were making good profits, but most of the concessions were due shortly to expire. That of the Austrian Telephone Company, formerly the Consolidated Construction and Maintenance Company, Limited, of London, granted in 1882, ran only for ten years, as did also those of the Vienna Telephone Company, except that for its first exchange in Vienna itself. The telegraph authorities, however, were determined to regain complete control of the industry, and ultimately bought in the latter concession in 1895 before its expiration.³

The ministerial order of October 7, 1887, which first definitely committed the government to the policy of public ownership, was an open declaration that the telegraph authorities had learned all they wished from the initial experimentation of private enterprise. They could now foresee the future growth of the telephone industry, and, foreseeing that, they felt bound, not only in the interest of the inhabitants of medium-sized cities, but in that of their own telegraphs, to take back the industry into their own hands. In Austria it did not require a long experience to convince the public authorities that the conduct of the telephone business was a task which they could not leave to others with

¹ A. P. T., 1889, p. 475; 1888, pp. 186-191. J. T., 1890, pp. 77-79.

² A. P. T., 1891, pp. 41-45; 1892, p. 340.

³ J. T., 1896, *Statistiques*.

profit to the community, while they retained the telegraphs in their own hands. Rather than abandon the telegraphs they acquired the telephones.

IV. HUNGARY

In Hungary, the Vienna Telephone Company secured a concession in 1882 to establish an exchange in Budapest.¹ The same events which served to convince the Austrian authorities of the wisdom of regaining complete control of the industry had a like effect upon the Hungarian.

The Hungarian law of August 8, 1888, concerning telegraph, telephone and other electrical undertakings, reserved to the state the exclusive right to establish thereafter, and operate, telegraphs, telephones, or electrical signals of any sort.² Private persons should be permitted, however, to erect such undertakings on their own property and solely for their own use. Concessions by the Minister of Public Works and Commerce, the head of the postal and telegraph administration, for public telephone systems might be granted under certain conditions. The concessions should be limited to fifty years and might be terminated sooner by the government. If not, all telephone plant reverted without charge to the government at the expiration of the stipulated period. Rates, as well as plans of construction, should require the approval of the minister. The latter was also authorized to supervise the operation of concessioned systems. If concessions should be acquired by aliens, the minister was empowered to annul them, or to require the appointment of a Hungarian citizen as manager. Finally, no concession for the establishment of an international long-distance line, or a local exchange in a place of over 10,000 inhabitants, should be granted without a special act of Parliament.

The intent of the government clearly was to make the telephone monopoly absolute wherever the telephone could come into competition with the public telegraphs. The law made possible the establishment of small undertakings in rural districts by local initiative, but beyond that the liberty of engaging in the telephone

¹ Brault, p. 160.

² A. P. T., 1889, pp. 497-500.

business was illusory. In 1906 there was only one exchange system that was not owned and operated by the government. That one was a rural exchange connecting forty subscribers and operated by one person.¹ In the same year, out of a total of 102,000,000 local exchange connections in Hungary, 43,000,000 were in the capital city of Budapest.² The use of the telephone in the rural districts was comparatively insignificant.

V. ITALY

In Italy, in the beginning, concessions were granted freely. The first company in the field was the *Società Generale Italiana di Telefoni*. In 1881 it established exchanges in a dozen of the largest cities. Presently, however, in the cities which appeared especially attractive for telephone operations, competition was inaugurated by a number of local companies. In Rome, Naples, Florence, Bologna, Venice, Genoa, Milan, and Turin the contest was keen. Rates were greatly lowered, but not enough to bring a real gain to the public, for in order to derive the full benefit from the service they had to subscribe to both systems. Hence in Milan, Turin and Genoa, the municipal authorities required the competing companies to consolidate. Then rates were raised again. In other places consolidations occurred voluntarily, until in a short time only two companies remained in all Italy.³

In 1883 the central authorities attempted to introduce order into the telephone business by revising the concessions and putting them all on a uniform basis.⁴ By a royal decree dated June 1, the obligations of the concessionnaires towards the telegraph authorities and towards the public were prescribed.

The companies were required so to construct their telephone lines as to prevent interference with the telegraphs. If the government should desire to build a telegraph line in a location already occupied by the telephone, the latter must make way. The telegraph authorities reserved the right to require the telephone com-

¹ J. T., "Statistique des communications téléphoniques, année 1906."

² *Volkswirtschaftliche Mitteilungen aus Ungarn zur Orientierung des Auslandes*. Herausgegeben vom Kgl. Ung. Handelsministerium, 1908, pp. 200-235. Art., "Post, Tel. und Tel. im Jahre 1906."

³ Lacombrade, pp. 16-17.

⁴ A. P. T., 1884, pp. 375-79.

panies to make alterations when they should deem it necessary for the protection of the telegraph service at the companies' own expense. The telegraph authorities even stipulated that they might make the alterations themselves at the companies' expense if the latter did not comply with their demands with sufficient alacrity. Competing concessionnaires were required to grant inter-communication between one another's lines to their respective subscribers. Public call offices might not be erected, nor schedules of rates put into effect, without the special approval of the telegraph authorities. No discrimination in regard to rates should be made between private subscribers, but the public offices and charitable institutions should be supplied with telephone service at half the regular rates. Separate switchboards should be provided for the lines of public officials. § The latter might at any time inspect the companies' books. The concessionnaires were required to pay an annual compensation for their concessions of 15 lire (nearly \$3.00) per private subscriber's station, 7 lire per official station, and 100 lire per public pay station. The latter heavy fee was avowedly levied in order to prevent the telephone from taking business away from the telegraphs.

Furthermore, the concessions might be temporarily suspended:

(1) when and so long as the public telegraph service from any cause whatsoever might be suspended; and

(2) whenever the government might deem such suspension necessary in the interest of public order.

The concessions might be permanently revoked for a variety of causes. One of these was failure by the concessionnaire to disconnect at once any subscriber permitting the use of his telephone by a non-subscriber. The concession was subject to alteration or revocation by any future legislation without compensation for forfeiture of rights granted under the original concession. There was no grant of monopoly. It was, however, stipulated that not more than three concessions would be granted for any one municipality, so long as the existing systems were maintained in an efficient condition. Unless sooner revoked, concessions were to run for three years, and then for an additional two years, unless notice of termination was given by the telegraph authorities.

At any time the public authorities might cancel a concession and acquire the plant of the concessionnaire at its actual value, to be determined, in case of dispute, by arbitration. Concessionnaires should not transfer any of their rights without the consent of the government, and any differences in regard to the interpretation of the concessions should be settled by the government itself.

These conditions certainly were not calculated to encourage the use of the telephone. It is impossible to suppose that the Italian telephone policy was devised with a view to enabling the telegraph authorities to avail themselves of the assistance of private enterprise in bearing the initial risks of introducing telephony into Italy. This policy was probably nothing more nor less than a deliberate attempt to spare the telegraph authorities the labor of properly caring for their trust by preventing as far as possible the telephone from coming into use.

For several years the Italian telegraph authorities persisted in their policy of throttling the telephone business. They declined to establish inter-urban lines, or to introduce the telephone into rural telegraph offices, as was done in Germany, as a supplement to the ordinary telegraph service. Meanwhile the companies exploited the urban exchange systems as only companies could whose career was liable to be terminated any day by the stroke of a pen.¹

At last in 1888 the Italian telegraph authorities were roused to a sense of their responsibilities toward the public, and, incited by the French proposals for the purchase of the private telephone exchange systems in that country, suggested a similar policy for Italy.² A bill to this effect was introduced into the Chamber of Deputies in the sessions of 1888 and 1889; but on account of the ministerial instability, no final action could be taken. In 1890 the bill was introduced for the third time. Meanwhile the telephone companies were forced to continue under the oppressive concessions of 1883.

The minister in charge of the postal and telegraph service re-

¹ A. P. T., 1887, pp. 742-753. Art., "Die italienische Telegraphenverwaltung."

² A. P. T., 1890, p. 317; J. T., 1890, pp. 45-46.

marked, in introducing his bill into the Chamber of Deputies, that the principle of free competition had proved a failure. While it endured, it caused a wasteful duplication of plant. It would also have caused much inconvenience to the public, but for the government's insistence that competing companies should permit intercommunication between their systems. This requirement, however, was unfair to the telephone companies, because it enabled the weaker companies to gain at the expense of their rivals. Moreover, competition had always been terminated by the fusion of the competitors. Finally, the intimate relation between the telephone and the telegraph made it necessary for the government to protect the telegraph revenues by measures that greatly retarded the development of the telephone service. The result was that the companies could neither improve their almost intolerable service, nor reduce their exorbitant rates. The companies were forced to restrict their operations to the most profitable parts of the field, and to neglect the rest. Since there must be a monopoly, the minister argued, and since the telegraphs were already in the hands of the public authorities, the telephones should be placed there also.¹

The Italian Government, however, was suffering from chronic financial troubles, even more serious than those of the French. The Chamber shrank from incurring such heavy financial obligations as were involved in the purchase of the telephones. The bill was rejected.²

The telephone companies were forced to continue the conduct of their operations under the old repressive conditions. Soon, however, the Crispi Ministry fell, and in the session of 1891 the bill was again introduced. The telegraph authorities can certainly not be accused of ignorance of the urgency for a change in their policy toward the telephones. Once more, however, ministerial instability and fiscal troubles caused the postponement of a change.

Finally, in 1892, in deference to the reluctance of the Italian Parliament to incur additional financial liabilities, the telegraph

¹ Lacava, Minister of Posts and Telegraphs; speech printed in full in the *Giornale delle Comunicazioni*, Feb., 1890.

² J. T., 1890, p. 107.

authorities modified their proposal. Although retaining the principle of a public monopoly of the telephone, and adhering to the belief that ultimately the government would have to undertake the management of the business itself, they conceded that for the present the government should not exercise its monopoly. Definite concessions should be granted for twenty-five years, with the reservation of the right of purchase after twelve years. In case this right should be exercised, the purchase price should be determined, in default of mutual agreement, by arbitration, and should not exceed the product of the average net income of the system to be purchased, multiplied by the number of years the concession should still have to run. At the end of twenty-five years the entire plant of the concessionnaire should revert to the government without payment. The concession should carry with it no grant of monopoly, but in most other respects the bill of 1892 provided a generous relaxation of the conditions of the concessions of 1883. In one respect only were the conditions still excessively onerous. Long-distance lines might be built by the telegraph authorities, or by concessionnaires. In the former case the telegraph authorities would require a guarantee from the concessionnaires of the exchanges to be connected by the line that the receipts would be equal to at least one-half of the sum received on the telegraph line connecting the same terminals. In the latter case the concessionnaire would be required to make good to the telegraph authorities any losses that might ensue on a parallel telegraph line. The bill became law on April 17, 1892.¹

The effect of the imposition of these conditions, intended to protect the telegraph revenues, was that after ten years there were only thirty-four private and three governmental long-distance telephone lines in all Italy. This restriction of inter-urban telephony, combined with the direct restrictions on local exchange operation, which even after the relaxation of the terms of the original concessions by the law of 1892 were sufficiently severe, had greatly hindered the development also of urban telephony. Italy fell behind the other nations of Western Europe in the use of the telephone.

¹ A. P. T., 1893, pp. 10-17.

Consequently, in 1903, fresh legislation was enacted in order to encourage the laggard industry.¹ Two unsuccessful attempts to secure legislation had already been made with a similar intent, but at last the chambers were won over to the views of the telegraph authorities, and consented to assume some financial obligations in order to help the suffering telephone industry to its feet. February 15, 1903, a law received the royal assent, sanctioning the ultimate expenditure of a trifle over six million lire (about a million and a quarter dollars), with which the telegraph administration was to connect all the important provincial cities by long-distance telephone within four years by the construction of eighty-four lines. Thereafter it would undertake to connect any two cities, in which there were local exchanges in operation, serving each as many subscribers as there might be intervening kilometers between the two cities. The telegraph authorities might, furthermore, waive their claim for compensation for loss occasioned to their telegraph receipts by the construction of private long-distance telephone lines, on consideration of the payment by the concessionnaire of 20 % of the gross receipts from such lines.

In addition to giving this impetus to the construction of long-distance lines, the act of 1903 attempted also to put new life into the local exchange business. The telegraph administration was authorized to establish local exchanges of its own, or to institute competition where it deemed it necessary in order to compel an existing company to improve its service, and to permit municipalities to exercise the government's right of purchase after twelve years, provided the government itself should not choose to make use of that right. The former provision was inserted for effect only, but the latter was meant to be used. The intention was ultimately to bring about a composite state of public ownership, like that in Holland, and like that intended to be brought about in England by the act of 1899, with the long-distance lines in the hands of the telegraph authorities, and the local exchanges in the hands of the municipalities.

There were grounds for believing that this result might be ac-

¹ A. P. T., 1903, pp. 345-350.

complished. The opening of the twentieth century witnessed the growth of a strong feeling in favor of municipal ownership in Italy, especially in the cities of the north. In this same year, 1903, a law was enacted, intended to encourage this sentiment, which specified the telephone as a fit subject for municipal ownership. In the five years following the passage of that law, the number of municipal business undertakings was increased from thirty-one to seventy-four. Among others, the number of municipal gas plants increased from fifteen to nineteen, the number of electric-lighting works from eight to twenty-three, and four street-railway undertakings were established. But only one municipality went into the telephone business.¹ The policy of municipal ownership of telephones failed.

The causes were various. The chief one was, perhaps, that public opinion generally believed the telephone to be a business that ought to be undertaken by the telegraph authorities. That certainly had long been the opinion of the telegraph authorities themselves. In 1906 the Italian Minister of Posts and Telegraphs at last proposed once more that this should be done immediately.² In order to avoid laying a too heavy strain on Italian finances, he proposed that payment be made by means of annuities, and that the cost of maintenance and extensions be defrayed from current operating receipts. This plan did not augur well for an energetic policy in the public management of the telephone business, but it suited the taste of the Italian Parliament. In 1907 a bill was introduced providing for the purchase of the twenty-seven exchange systems and eighteen long-distance lines then operated by the two leading Italian telephone companies. The price should be paid in eleven annual installments out of the expected future profits of the public telephone service. July 15, 1907, this bill became law.³

Private ownership of telephones endured longer in Italy than in any of the other countries that have yet been considered. The

¹ *Annuario Statistico delle Città Italiane*; Anno II, 1908, p. 282.

² J. T., 1906, p. 146.

³ E. T. Z., 1907, p. 818. The proposed organization of the Italian telephone service closely resembles the existing organization of the French. Cf. A. P. T., 1908, pp. 92-98, Art., "Die Verstaatlichung des Fernsprechwesens in Italien."

Italians were especially reluctant to sanction the undertaking of a business enterprise of such magnitude by their telegraph authorities. Nevertheless, they too had to yield ultimately to the pressure of circumstances.

The causes that eventually led to a resumption of the telephone business by the government in these countries were complex. The details of the arrangements with private enterprise were various. Some telegraph authorities displayed more wisdom and breadth of view than others. Some legislative bodies proved quicker to learn the lessons of experience, or were less hampered in their action by political instability or financial stress. But underlying all the diverse arguments and local events that led to public ownership in these countries, one circumstance was decisive. That was the ownership of the telegraphs by the government. No country was able to retain the possession of its telegraph system, and at the same time leave the telephone in alien hands. The conflict of interest was too sharp. No country cared to abandon its telegraphs. Therefore it was compelled to acquire the telephone.

The failure of free competition to give the public a cheap and efficient service, the difficulty of so regulating a private monopoly as to accomplish the same end, the political and economic advantages of the direct control of monopolies of great public importance by the state, the economy of the joint operation of the telegraph and the telephone by one central management, all these reasons for public ownership were pointed out with more or less sincerity. But the conclusive reason was that the telegraphs were already in the hands of the government, and the nature of the telephone made any permanently satisfactory arrangement for leaving it in private hands impossible. Whether the telegraph authorities seriously endeavored to utilize private enterprise in overcoming initial difficulties, or merely employed it as a cloak to hide their own lack of enterprise, the result was the same. When the former motive was dominant, the relations with private enterprise proved somewhat more satisfactory to the public than when the latter motive prevailed. In either event, the public authorities could not avoid the ultimate responsibility for the conduct of the telephone business.

CHAPTER XXI

PRIVATE OWNERSHIP OF TELEPHONES IN NORWAY, SWEDEN, DENMARK, AND SPAIN

I. NORWAY¹

THE first telephone instruments were brought into Scandinavia by the International Bell Telephone Company of New York, in 1880. In the same year local franchises were secured from the municipal authorities in the Norwegian cities of Christiania and Drammen. These two cities were the only ones in Norway in which the Bell interests ever established exchanges.

In 1881 the task of extending the telephone service to other cities was taken up by independent telephone companies and associations, and a second exchange system was even established in the Norwegian capital, Christiania, expressly to compete with the existing Bell system. The rival undertakings maintained a vigorous competition for several years. The public in Christiania, as in Brussels and a number of the Italian cities, quickly reached the conclusion that competition was more to its detriment than to its advantage. Many subscribers found themselves compelled to join both systems, and thus lost the benefit of the cut rates which the competition produced. At the same time the confusion of lines, caused by overhasty construction, and the numerous short circuitings which resulted, soon brought about an intolerable state of affairs. In 1885 the municipality could endure competition no longer, and requested the rivals to combine, or at least to come to terms with one another. Unless future construction were planned with a greater regard for the interests of the municipality, the municipal authorities threatened to refuse the further grant of rights of way over the city streets. This threat fell on receptive ears, and in 1886 the fusion was consummated. The municipal

¹ *Tarifs tél.*, vol. i, pp. 200-233. Art., "Norvège." This article is based on the Report of the Royal Commission appointed Dec. 7, 1892, to draw up a plan for regulating the relations between the private telephones and the state.

authorities themselves acquired an interest in the new company, and the further development of the Christiania exchange system proceeded much more to the general satisfaction.

In Drammen, the only city outside of Christiania in which the Bell interests established an exchange, the business remained in their hands until 1889. Then it was disposed of to a local stock company. The proposal in 1880 to connect Drammen and Christiania by a long-distance line first led the Norwegian government to take a hand in telephone affairs.

The public authorities feared that the unrestricted establishment of long-distance lines between cities already connected by the state telegraph system would seriously prejudice the telegraph revenues. At that time the government was operating all the telegraphs in Norway, but without any exclusive right. Accordingly at the end of the same year (1880) a bill was introduced into Parliament to reserve to the government the monopoly of the transmission of messages by telegraph, telephone, or any other electrical or mechanical means whatsoever. This bill became law on May 19, 1881. Provision was also made in this law for granting concessions under certain conditions to private persons for the establishment of telephone systems. As a result of the law, however, the project for a long-distance line between Christiania and Drammen was abandoned. The company, indeed, requested a special license authorizing it to establish such a line. The telegraph authorities replied that a license would be granted on condition that the company guarantee to make good to the government all losses occasioned to its telegraph business between the two cities by the installation of the telephone. The company did not feel able to accept that condition, and the line was not built.

The local authorities at Drammen aided in bringing about this result by failing to support the Bell Company in its application for a license. They dreaded lest the improvement of the means of communication with the capital would injure local business. Between the departmental jealousy of the telegraph administration and the local jealousy of the city fathers of Drammen, the prospects of the Bell's long-distance telephone business were not bright.

This first experience under their new law caused the telegraph authorities to consider whether they were not doing wrong in declining to undertake the telephone business themselves. However, the uncertainty of the business, and the general dissimilarity in the applications of telegraph and telephone, and especially the inconvenience of procuring the supplies of capital which would be required in order properly to develop the infant industry, led the director of the state telegraphs to adhere to his original decision to leave the telephones to private enterprise. So long as adequate safeguards were erected for the protection of the telegraphs at the one point where the two services came into conflict, there was no need to fear any ill effects from a policy of private ownership of telephones. That he could erect adequate safeguards, now that his position was fortified by the grant of monopoly, was unquestionable.

Meanwhile the use of the telephone was increasing. Companies which had confined their operations in the beginning to the interiors of the cities, began to spread out their lines into the country. At first the telegraph administration sought to restrain the concessions within prescribed limits, usually within eleven kilometers of the center of the city. The restriction had the two-fold object of assuring a rational conformation of exchange systems and of preventing them from coming in contact with one another, for the latter event meant ultimate competition with the state telegraphs. The administration made it a rule not to permit the telephone systems in two neighboring communities to come within two kilometers of one another. But in Norway such action on the part of the telegraph administration was futile. The telephone filled a big void in the semi-isolated lives of the sparsely settled Norwegian population. The telegraph administration found it impossible to maintain its restrictions in their original severity. But as they were gradually relaxed, the telegraph revenues were found once more to be seriously threatened.

Consequently, the principle of the isolation of each exchange system was modified, but not wholly abandoned. The telegraph administration consented to permit the connection of adjacent telephone systems by long-distance lines, provided that the same two

communities were not already connected by telegraph. Even this restriction was eventually broken down. The first inter-urban telephone line actually to parallel a telegraph was constructed in 1885, four years after the failure of the Bell Telephone Company's project. The promoters of this line were required to pay a special fee of \$125 a year in order to recompense the telegraph administration for its prospective losses. Thereafter the government pursued the policy of exacting compensatory guarantees from all promoters of competing long-distance lines. These fees usually were fixed at a third to a half of the receipts previously received from the telegraph service. Often the actual losses were greater than that. This policy was defended on the ground that, as the state had established many telegraph offices which did not pay their expenses, solely in the interest of the communities which made use of the service, it was only fair that the latter should now help bear the loss that was caused by the introduction of the telephone. Experience showed that these losses were considerable. The people of the kingdom, who really owned the telegraphs, would have to bear them in one way or another. There was no juster way of apportioning them than by assessing them, at least partially, upon the communities which caused them by making use of the rival service.

About this time the telegraph administration began to make use of the telephone in its own telegraph service. This application of the telephone was for the purpose of establishing cheap communication between the general telegraph system and isolated fishing villages. The villagers supplied the heat and lighting for their office and kept an attendant on hand. By this means telephone connections could be maintained the year round with small villages which before had been able to support a telegraph service only during the height of the fishing season. This use of the telephone came to be more and more popular in the smaller communities which had previously been altogether without telegraph service, and the further extension of the telegraphs was accordingly checked. Sometimes the telegraph administration even suppressed a more unprofitable telegraph office and converted it into a public call office in connection with the nearest telephone

exchange system. Finally long party lines were built to connect a series of detached forest or fishing villages by telephone instead of by the more costly telegraph. The first of these, built in 1888, was about seventy miles in length and joined eight stations to the general telegraph system of the kingdom.

Meanwhile the extension of exchange systems into the rural villages went on apace. Exchange lines were also built out into the open country. The regions between the villages in many parts of Scandinavia, unlike the *plattes Land* in Germany, do not consist solely of uninhabited plough-land, meadows and woods, but, on the contrary, are dotted here and there with solitary cottages. On the other hand, the villages are much farther apart. Rural life has more in common with that of the American North and West than with that of the German *Dorf*. These scattered homes were filled with a homogeneous race of people, attached to one another by strong ties of fellow-feeling, and ready to make considerable sacrifices in order to improve their facilities for social intercourse. The Norwegian people, despite their monarchical form of government, more nearly attain the democratic ideals of equality and fraternity than any other people in Europe. To many a rural family, dwelling far from its nearest neighbors, and shut in by the inclemency of the weather during a part of the year, the telephone was a godsend. A decade after the first introduction of the telephone, there existed scarcely a village in Norway, no matter how small, which was not only itself provided with a telephone system, but served as a center for long lines radiating deep into the surrounding country.¹

This rapid development was not secured through the agency of telephone companies of the sort to which the French and Italian telegraph authorities had intrusted the initial work of telephone development in France and Italy. The Bell company, which first brought the telephone into Norway, did not build up a monopoly of the business in the important centers to the neglect of the rest of the country, as was policy in the South. On the contrary, before the end of the first decade, it abandoned the few exchanges

¹ A. P. T., 1891, pp. 467 ff., and 538 ff. Art., "Das Fernsprechwesen und die Fernsprecharte in Dänemark, Schweden, und Norwegen."

which it had been able to establish at the beginning. It found the soil unfavorable to the growth of a huge monopolistic enterprise of the sort its differently situated French and Italian prototypes had created. In Norway, not central, but local enterprise was the source of energy behind the astonishing expansion of the telephone business.

In each town and village, the leading citizens joined together and took the responsibility for the local development of the telephone service into their own hands. They formed small joint stock companies in which each prospective telephone subscriber in the community possessed at least a share, or mutual associations which assumed the initial expenses of construction, and raised the needed capital by assessments upon the members, or pure coöperative societies in which each member bought his own line, material and instrument, and shared with his fellows the labor of building the central office. Occasionally the village authorities themselves took the matter into their official hands, and built a village exchange system at public expense. The universal conviction that the establishment of telephone exchange systems was an undertaking for the common good of all the people led to every manner of aid and support of such undertakings. Rights of way were furnished free of charge, poles and similar material were supplied at cost, and the members of each community gladly volunteered their services in the cause of universal communication by telephone. The business management of the mutual and coöperative systems was placed in the hands of committees, chosen by the members, which served without payment. The directors of the local stock companies often did likewise. After the initial capital had been raised by popular subscriptions and special assessments, each member of an exchange system paid an annual contribution toward operating expenses and maintenance, usually fixed according to the use which he was presumably making of the service. Extraordinary expenses, caused by disasters or otherwise, were covered by special assessments, determined chiefly by the members' ability to pay. No pains were spared to render the operation and maintenance as cheap as possible. No money was spent where the services of the telephone users

could be utilized instead.¹ Thus, in one way or another, these local telephone systems sprang up throughout Norway during the latter part of the first decade after the introduction of the telephone, and quickly covered the country with a network of lines.

Each local management devised for itself its own plan of construction and framed its own conditions of operation. Legislation put no technical restrictions in the way of the construction of lines and the stringing of wires.² The result of this freedom of local initiative was that scarcely any two systems were alike. The general hurry to secure telephone service caused the work to be carried out with a total disregard of any general rules of telephone practice. The standard of construction was often too low, materials too cheap, and work too hasty. The audibility of even the local lines was bad, and the service of the exchanges inadequate. These conditions were worse on the longer lines.³ Hence, when the development of the local service reached the stage where further progress lay in the construction of toll-lines in order to secure intercommunication between the neighboring village services, the lack of coördination became a serious impediment. The diverse local systems could not easily be adjusted to the uniform and more exacting technical requirements of a long-distance system. The long-distance lines were unworkable unless composed throughout of metallic circuits, and much inconvenience was caused by the difficulty of operating lines built partly of metallic circuits and partly of earlier and less expensive single-wire circuits with earth return. For a considerable period these technical difficulties, combined with the hostile attitude of the telegraph administration, retarded the construction of inter-urban connections.

The need for central supervision and coördination became greater and greater as the local systems expanded more and more widely over the country. Not until after 1890 did the local authorities succeed in coöperating with one another sufficiently to undertake the task of welding the heterogeneous local systems into

¹ H. Schwaighofer: *Die Grundlagen der Preisbildung im elektrischen Nachrichtenverkehr*; München, 1902, p. 68.

² *Ibid.*, p. 69.

³ Schwaighofer, p. 70.

one homogeneous national system. Clearly this work could not be executed on any considerable scale without the active coöperation and leadership of the telegraph authorities themselves. With the completion of the initial task of local construction, the policy of local initiative had accomplished its best work. The early telephone enterprises were admirably adapted to the peculiar needs of the country at that stage of the development of the telephone business. Further progress was dependent on the substitution of centralized for localized initiative. The Norwegian telephone system required to be organized on a larger scale. That was the situation which confronted the royal commission appointed in 1892.

The time had come when the telegraph authorities could promote the broadest public welfare by abandoning their original policy of restricting the long-distance telephone business. The telegraph authorities themselves might lose thereby a portion of their telegraph revenues, but to the public it was a matter of less concern. The telephone in Norway was not a luxury confined to the commercial classes and wealthy few, as in most parts of Europe, but a universal indulgence of all classes. What the common citizens would lose in their capacity of taxpayers and owners of the governmental telegraphs, they would gain in their capacity of users of the telephone. The depreciation of the public investment in the telegraphs would be more than counterbalanced by the increased utility of communication by telephone. It was merely a question of putting into one pocket what came out of the other. Since the public obviously preferred to use the telephone, the telegraph authorities should have taken the service at once into their own hands, and made the public pay the bill to themselves directly instead of through the medium of vexatious guarantees exacted from private companies. So long as the nation itself owned the telegraphs it was compelled itself to bear the loss caused by the improvement of the means of communication. There was no way by which the loss could be shifted to the shoulders of any one special class in the community. Had the telegraphs been exploited by private capitalists, there would have been at least a chance of putting the burden on them. As matters actually stood, to leave the future construction of long-distance lines to private capital-

ists simply enabled them to put into their own pockets at least a portion of the future losses of the telegraph administration. Yet that is what the telegraph authorities decided to do.

Since 1892 the construction of long-distance telephone lines has been undertaken by big stock companies. To be sure, much of the stock is held by the same interests which had previously built up the local exchange systems.¹ But that is, after all, an unsatisfactory makeshift. Moreover, the telegraph authorities could not make up their minds definitely to keep out of the telephone business. They have dallied with the idea, and have bought a good many of the more important exchange systems as their concessions expire. This has required them to take a corresponding portion of the long-distance business into their own hands. In 1906 both the local and the long-distance business was about evenly divided between the government and the companies. On the whole, the government dominates the situation in the larger cities, and the companies in the more sparsely settled rural districts.² This division of responsibility cannot form a basis for permanently satisfactory conditions in telephone administration. There is little doubt that ultimately the entire business will find its way into the hands of the state.

II. SWEDEN

In Sweden, the general course of development has been the same as in Norway, but some of the details have been strikingly different. In particular, the long-sustained and sharply-contested competition in the city of Stockholm has aroused interest among advocates and opponents of the policy of telephone competition. In Sweden, as in Norway, the government had no legal monopoly of the telegraph business at the time of the invention of the telephone. The government in fact conducted the entire telegraph business of the country except for the lines employed by the private railroads for signal purposes. But at the time when the telephone was introduced, it declined to undertake the new venture and left the field clear for private enterprises.

¹ Schwaighofer, p. 70.

² J. T., *Statistique générale de la Téléphonie*. Année 1906.

In 1881 the International Bell Telephone Company established exchange systems in Stockholm, Gothenberg, and Malmö.¹ Development was not rapid until 1883. Then mutual telephone associations began to spring into existence in rural Sweden, and competition was inaugurated in Stockholm itself. The Stockholm *Almänna Telefonaktiebolaget*, or General Telephone Company, was organized by some capable and enterprising Swedish engineers, who entered with zest into a struggle with the Bell.² For a few years the contest was waged on even terms. Then the superior business management of the Swedish concern proved too much for its older rival. After 1885 the number of subscribers to the Bell system began to dwindle. In 1890 a controlling interest in its affairs was acquired by the General Telephone Company, and in 1892 the latter openly transformed the Bell system into a branch of its own, and assigned to it the business of one section of the city. Thus terminated the telephone competition in Stockholm as far as private enterprise was concerned.

Meanwhile the unrestrained operation of public-spirited local enterprise in the rural districts had produced a marvelously widespread use of the telephone. Before the end of the decade, the isolated village systems of the small local stock companies, mutual telephone associations, and coöperative societies, were beginning to spread out their branches towards one another. The branches quickly met, and inter-urban telephony was established. Long before this the government had tried its hand at the telephone business in a small way. In 1882 it established a small exchange in Stockholm in order to connect the government offices, and in the following years it had acquired several exchange systems in connection with the extension of its telegraphs among the fishing population in the South. These enterprises caused it to build a few long-distance lines in that region on its own account, but no work of considerable magnitude was attempted until 1889.

In that year the General Telephone Company, which had for some time been extending its lines beyond the municipal area of Stockholm, applied for the concession of rights of way in order

¹ Brault, p. 231.

² Gustave Sundbärg: *La Suède*. Stockholm, 1900. Vol. ii, pp. 457-462.

to build long-distance lines across the southern part of Sweden, from Stockholm to Gothenberg and Malmö. This proposal caused the government to take a new interest in the telephone business. For some time the telegraph administration had been watching with jealous eyes the continued spread of the inter-urban telephone. Now it saw that the time had come for it to act, if it would preserve its control of the transmission of intelligence among the Swedish cities.

The government met the issue squarely. It made no attempt to protect its telegraph revenues by preventing the too rapid growth of the long-distance telephone. On the contrary, it immediately reduced its telegraph rates. But it did not stop there. It assumed directly the whole responsibility for the further conduct of telephone business throughout Sweden. Rejecting the proposal of the General Telephone Company to build the long-distance lines through Malmö and Gothenberg, it undertook at once to build these lines itself with its own resources. At the same time it inaugurated a policy that was calculated to throw the local exchange business also into the public hands. It announced that the government would undertake to connect as speedily as possible all existing local systems, but that the use of the governmental long-distance lines would be granted only to subscribers to governmental exchanges. The effect of this policy was to compel the sale of most of the local undertakings by their promoters with all possible dispatch to the government. Within three years after the initiation of this aggressive policy, three quarters of all the local systems in Sweden had passed into the hands of the state.¹

The General Telephone Company, however, had built up a large and profitable business, and did not wish to sell out to the state. It had just completed the conquest of its old rival and now wanted to enjoy the opportunity of reaping the harvest it had sown. Very likely the government foresaw that result. At any rate, it allowed the company no such opportunity, but carried the war directly into the enemy's country, to adopt the military phraseology which is most in keeping with the events about to be described. The small system, which it had previously established

¹ *Tarifs 1881*, vol. i, pp. 85-90.

in Stockholm for official use, was made the nucleus of a general public system. Rates were cut below the level of those maintained by the company, public call offices were installed, and the long-distance lines of the whole country were placed at the disposal of the local subscribers to the governmental system. These energetic measures speedily brought the General Telephone Company to terms.

Yet the company was unwilling to withdraw altogether from the telephone business. An agreement was made, to go into effect on May 1, 1891, by which the company sold to the state all its telephone lines and exchanges situated more than seventy kilometers from Stockholm, and bound itself to confine its operations thereafter to the area described by that radius. The government, on its side, granted the company a special concession to run its lines over the public ways within that area for fifty years, and also entered into a mutual arrangement with the company by which the latter's subscribers could make use of the long-distance lines belonging to the state. The latter arrangement was, however, terminable by the state upon due notice. A prolonged and energetic competition for local patronage was then inaugurated, in which each side attempted to outbid the other in offering the public an efficient service at cheap rates.

The result was an exceptional stimulus to the technical improvement and adaptation of the service to the diverse wants of the consumers. The Swedish telephone manufacture had already gained a high place in the esteem of continental telephone users, and the competition between the state and the company raised it to an even higher plane of technical perfection. The General Telephone Company had already, in 1885, installed the first multiple switchboard in Europe. Now it followed this improvement by the introduction (1893-5) of metallic circuits upon its local lines in Stockholm.¹ In 1889 it applied for permission to put its wires underground, but the prosecution of the work was delayed. In 1895 the conversion of the aerial into underground lines was begun again and carried on with vigor. The state showed itself able to hold the pace set by its strenuous rival.

¹ Sundbärg, vol. ii, p. 462.

In regard to rates, the results were equally prompt and definite. The original flat rate of the Bell Company was 160 kronen (1 krone = 26.5 cents) in the inner city, and 240-280 kronen in the rest of Stockholm.¹ Upon inaugurating competition, the General Telephone Company cut this rate at once to 100 kronen. Later, when it found its position more secure, it introduced an improved class of exchange service, for which it charged 125 kronen. For the unlimited use of the company's toll-lines within the area in which it was authorized to do business, there was an extra charge of 50 kronen. Now the state in its turn undertook to play the same game, and began by cutting the company's flat rate to 80 kronen. It charged, however, an additional preliminary fee of 50 kronen for direct lines within the inner city provided with metallic circuits.² The company retorted by devising new kinds of service. It offered two-party lines at 80 kronen a year, and four-party lines at 60 kronen. It also offered a limited service at 36 kronen a year, for which the subscriber was entitled to 100 talks a quarter. Such classes of service were, until then, unknown in any large European center. In 1891 it experimented with a more audacious innovation. It offered to install a line and instrument for 10 kronen a year, the subscriber to pay in addition .10 kronen per message. This class of service had already been tried in America, especially at San Francisco, and was destined to play an important part in later telephone practice; but at this time the company could not make it pay. It was abandoned after two years' trial. Still the rate-war continued.

A dozen years after the commencement of this unique struggle, the government's rates had been further reduced.³ A special class of "business-service" was introduced at 60 kronen and of "residence-service" at 50 kronen. Both these rates were lower in Stockholm than in any government exchange outside of the area subject to competition. In other words, the government was discriminating between its own citizens on the sole ground that the lower rates were needed for competitive purposes. The company too had brought its rates down to a lower level than at the begin-

¹ Sundbärg, vol. ii, p. 461.

² *Tarifs tél.*, vol. ii, pp. 289-305.

³ A. P. T., 1891, pp. 467 ff., and 538 ff.

ning of the contest. In fact, it had been forced to reduce its direct line flat rates to the old government level of 80 kronen. This prolonged rate-war, combined with an excellent service, quickly produced a telephone development in Stockholm that put it far ahead of any other city in the world.

This condition of affairs could not last. The company fully held its own so far as its hold on the business was concerned, but its finances began to show the strain. Instead of the golden harvest it had anticipated after the subjugation of its early rival, it saw no prospect ahead of it but of declining dividends, doomed sooner or later to give place to actual deficits. The government was in no better plight so far as its local business in Stockholm was concerned. It was notorious that the telegraph authorities were losing money on that part of their undertaking. Clearly it could only be a matter of time before the party with the longer purse would win, and the other be crowded to the wall. Nor could there be much doubt which this party would be. The company might still for a long time call upon its stockholders to throw good money after bad in the hope of getting it all back together, but this process could not go on indefinitely. On the other hand, the resources of the government were fed from the inexhaustible pockets of the taxpayer.

The only way of escape for the company was to compel the government to buy it out. Undoubtedly the government would have bought out the company gladly at any time at some price, but the company wanted to pull itself out without sacrificing all the profits of its early years. It overdid the attempt, and the government, exasperated, broke off negotiations. In 1903 it even denounced the arrangement for direct connections between the company's subscribers and the state long-distance lines.¹ Since then the company has been keeping up the fight in default of less disagreeable alternatives.

At the beginning of 1907 there were 89,505 subscribers' stations, and 1306 public pay stations connected with the state telephone system. There were 971 telephones in 17 surviving coöperative telephone systems, of which 14 were in country districts. The General

¹ *Tarifs tél.*, vol. ii, pp. 300, 305.

Telephone Company had 44,512 stations in connection with its system. In the city of Stockholm itself the company maintained 37,331 stations and the government only 13,223. This was a development more than three times as great as that in any other city on the Continent of Europe, except the capitals — Copenhagen and Christiania — of the two other Scandinavian countries. Even they had not nearly half the development of Stockholm.

On the other hand, during the latter part of the competitive period neither party has kept its system in the van of technical progress as at the beginning. The general impoverishment and precarious future of the company has prevented it from sinking any but the most indispensable additional capital in its plant. Without question the plant is being allowed to run down. The company has not yet introduced such a great improvement as the common-battery method of operation into its exchange system. At the present time one would not go to Stockholm in order to see an example of the best attainable telephone service. Nor does Scandinavian long-distance service compare in efficiency with that which is demanded by the more exacting commercial users in, for example, the industrial districts of Germany.¹

Competition in Sweden has demonstrated that a governmental telegraph administration can follow the lead of a private competitor. The Swedish telegraph authorities have displayed ample ability to adopt all the methods that are so dear to private business managements in competing industries. They have cut rates, discriminated against the districts in which they enjoyed a monopoly, taken every advantage of the fact that they possessed long-distance lines which their rivals could not duplicate and, in general, made the most of their position in order to bring as much discomfiture as possible upon their rival. The company, on its part, enjoyed a good lead at the start and has maintained a strong fight. Nowhere else in the world has there been furnished a better illustration of genuine competition in the telephone industry.

The episode offers no convincing proof that competition in telephones is desirable. That it has brought the telephone into greater use than could have been accomplished by any other means is un-

¹ Schwaighofer, p. 72.

questionable. But the price is too heavy. Nominally, to be sure, the rates are cheap. In fact, the subscribers to each system are deprived of convenient communication with the subscribers to the other system. Hence, the competitive service is not worth so much as a monopolistic service would be. In the second place, the maintenance of two costly sets of apparatus for performing the work that might better be performed by one, requires the expenditure of much capital for needless digging of holes in the sidewalks, and trenches in the streets, and for needless duplication of exchange-equipment and line-construction. Hence, the actual cost of the competitive service is greater than it would be under centralized management. Finally, somebody does have to pay the difference between the existing cheap rates and the actual cost of the service. This may be done by depressing the wages of employees below the rates currently paid elsewhere, or by compelling the telephone investors in the community to pocket losses instead of profits, or by compelling the taxpayers in general, or users of government telephones in non-competing areas in particular, to pay more than they justly should. The low rates are therefore illusory.

In fact, all these methods of making up the difference are employed in Stockholm. The wages are lower relatively to wages in general in Sweden than in Germany.¹ Nor do the employees enjoy the benefits of public insurance against sickness, old age and accident which forms such a commendable feature of the labor policy of German governmental enterprise. Secondly, the investors who have furnished the capital for the private telephone system in Stockholm are very unlikely ever to get the full amount of their investment back. It is not well for any country to deprive of a fair recompense those of its citizens who have lawfully engaged in the task of rendering the community a service of real public importance. Finally, it is highly unjust that the public authorities should discriminate against the less advantageously situated subscribers to the governmental telephone system for no other reason than that they are less advantageously situated.

The policy of the Swedish government in engaging in protracted commercial warfare with a company of its own citizens cannot

¹ Schwaighofer, p. 71.

therefore be commended. The artificial and abnormal stimulus thereby given to the telephone business does not justify the adoption by a government of business methods of the character that the Swedes have employed. At the same time the episode sheds a deal of light on the effects of telephone competition in general. Undoubtedly, as long as the competitors are able to wage the contest with vigor, the consumer is in certain ways distinctly benefited. In such a business as the telephone, however, the very fact of competition in itself implies a limitation of the value of the service, while everything conspires to put an early termination to the illogical situation. The benefit derived from competition is one for which somebody sooner or later must pay, and it is by no means certain that this "somebody" will not prove to be, under one guise or another, the consumer himself. As a permanent *status* for the telephone industry, competition is neither desirable nor possible.

III. DENMARK

The only European countries of importance in which the public authorities have not yet engaged in the telephone exchange business are Denmark and Spain. The development of the industry in Denmark can be sketched in a few words.¹ The telephone was introduced into Denmark by private enterprise, and for a long time was operated exclusively by that means. For a long time the state telegraph administration had no connection whatever with the industry and displayed no desire to have any connection with it. The condition of the country and the character of the people were favorable to an extensive use of the telephone. The telephone was rapidly made available to the entire Danish population, both urban and rural, by the same combination of local private enterprise and public spirit that manifested itself with such good initial results in Norway and Sweden. The result of the play of these local forces was the ultimate development of a number of large, well organized stock companies, each holding a practical monopoly of the telephone business in a single district.

In 1905 the situation was as follows:² the state possessed by

¹ A. P. T., 1891, pp. 467 ff., and 588 ff.

² *Tarifs tél.*, vol. ii, pp. 126 ff. Cf. J. T. "Statistiques pour l'année 1906."

law the monopoly of the telegraph and telephone business. In practice it had granted the right to carry on the latter to eleven private companies, one for the peninsula of Jutland and one for each of the important islands of the kingdom. The government reserved the right to withhold its sanction from the rates of these companies and to establish and operate long-distance telephone lines connecting the systems of the different companies. All other long-distance lines, namely the lines connecting the different exchanges of the same company, were constructed and operated by the company concerned.

IV. SPAIN

The development of the telephone business in Spain may be briefly alluded to.¹ No attention appears to have been bestowed on the telephone until 1884. In that year, by a decree of August 11, the government reserved to itself the exclusive right to engage in the telephone business anywhere in Spain. The government seems to have done nothing further in the premises for two years. Then, concluding that it did not care to engage in the business at all, it issued the decree of June 13, 1886, by which the task of introducing the telephone into Spain was confided to private enterprise. This decree established the principle of the grant of the monopoly of the telephone business in each city to the highest bidder. The government determined in advance the maximum rates which should be charged, and awarded the concession to the applicant who promised to give the government the largest percentage of the gross receipts. No concession was to be granted, however, unless the government was assured at least 10 per cent. In the most important commercial cities the percentages actually obtained greatly exceeded this amount. Thus, in Barcelona, the rate was 33.75 per cent and in Bilbao it reached 34 per cent. Altogether thirty-five exchange systems were established under these conditions.

Nevertheless, it was not long before the government reached the

¹ Translations of the successive royal decrees and ordinances in relation to the conduct of the telephone business in Spain are printed in *Tarifs tél.*, vol. i, pp. 124-143, and vol. ii, pp. 135-182.

conclusion that the policy of handing over the telephone business to local monopolies, even when the maximum rates were determined in advance, was not calculated to promote the best interests of telephone users. There was no method of securing the reduction of the rates after the maximum ceased to be reasonable, nor of securing extensions of the service which would diminish the monopoly profit. By a new decree of November 11, 1890, the government abandoned the principle of monopoly and, reserving to itself the right to establish exchange systems where it saw fit, it threw open the telephone business to all who cared to engage in it. It absolved the existing companies from the obligation to pay the stipulated shares of the gross receipts, or any special tax of any sort whatsoever. The principle of the limitation of maximum rates was retained, but in all other respects the decree of 1890 conferred upon all persons who should engage in the telephone business all the liberty of action which they would have had in any ordinary business.

The Spanish government has never taken advantage of its reserved right to engage in the telephone business, and at the present time operates only a few long-distance lines for its own administrative purposes. The ordinary commercial long-distance lines, as well as the local exchanges, remain in the hands of private companies. But competition has been conspicuously absent. The failure of the policy of free competition was ultimately recognized by the government, and on June 9, 1903, an ordinance was issued providing for the conduct of the business on the basis of the *status quo*, in default of the exercise by the government of its own powers under its nominal policy of public ownership. The telephone business is still conducted in Spain by a number of private companies each possessing a monopoly in its own district.

The telephone policy of the Spanish government cannot be regarded as indicative of the possession by the public officials of either administrative capacity or the spirit of enterprise. Without these two qualities no government can hope to carry on any business undertaking in a business-like manner. Doubtless the Spanish government does wisely in leaving telephone users to worry along as best they may with the private monopolies.

Such is the record of private ownership of telephones in Europe. Private ownership was the original policy of every important country in Western Europe except Germany and Switzerland. Private ownership exists to-day only in Denmark and Spain, and partially in Norway, Sweden, and Holland. What was the cause of this nearly universal abandonment of the policy of private ownership? Was it that private ownership proved unable to give a satisfactory service at a reasonable price?

Under private ownership a more extensive use of the telephone was brought about in some countries than in others. In France, Spain, and Italy, the development under private ownership was small, in Scandinavia great. In Norway, for example, in 1906, there were almost twenty times as many telephones *per capita* as in Italy. In the latter country there were only 119 exchange systems in operation in all the 1766 cities and villages in which the establishment of telephone systems was sanctioned under the law of 1903. In Norway, on the other hand, practically every city and village in the kingdom was supplied with telephone service within a dozen years after its first introduction. A similar contrast exists between the telephone development in Denmark and in Spain.

The causes of these varying results attained under private ownership were partly the differences in the demand for telephone service, partly the differences in the policy of the telephone managements. The demand for telephone service has been greater in Norway than in Italy for the following reasons:

(1) in Norway the rural population is more scattered than in Italy, and feels a need for artificial means of local communication which the Italian peasantry does not feel;

(2) in Norway there is no such cheap supply of labor as in Italy, and labor-saving devices of all sorts are universally more useful;

(3) in Norway there is a more equitable diffusion of wealth, and consequently the telephone is within the means of a greater portion of the community;

(4) in Norway there is a broader diffusion of education than in Italy, and a correspondingly broader basis of appreciation for such a medium of communication as the telephone;

(5) in Norway there is a greater degree of social equality than in Italy and consequently a greater quantity of social intercourse to be facilitated by one means or another;

(6) in Norway the alternative means of communication are less adequate to meet the existing need than in Italy; and

(7) in Norway the habits of the people and their general manner of living make communication in the ordinary course of daily existence less frequent and less easy than is the case in Italy. In short, in Norway, both the nature of the country and the character of the people create a demand for telephone service far stronger than can possibly exist in Italy.

But these differences in demand do not wholly explain the more extensive use of the telephone in Norway than in Italy. In response to the divergent nature of the demand, the modes of supplying the service in the two countries were bound to assume different forms. In the former country, for the most part, the local needs of small detached communities were met by local initiative. In the latter country the special needs of small detached classes, the financial and commercial interests in the great cities, were met by centralized commercial undertakings. The Norwegian village enjoyed ample security for a satisfactory local service by virtue of the fact that the service owed its very existence to the initiative of those who made use of it. The Italian city had no security for a satisfactory service because, after the breakdown of the principle of competition, there was no harmony of interest between the profit-seeking owner and the unprotected user of the service. The policy of the Norwegian local telephone company, or mutual association, was to give its stockholders, or members, as good a service as they desired as cheaply as possible. The policy of the Italian centralized telephone corporation was to give its subscribers as bad a service as they would tolerate as dearly as possible. In Norway, so long as the telephone business was confined to local communities, private ownership of telephones was certain to give satisfaction. In Italy, unregulated private ownership was certain never to give satisfaction.

Towards these two fundamentally different forms of business enterprise the public authorities assumed wholly different atti-

tudes. In Norway the policy of the public authorities was to leave local initiative to follow its own bent so long as it confined its attention to local needs. In Italy the public authorities found it impossible from the very start to leave private enterprise to follow its own bent even in purely local affairs. But the failure of competition to provide an adequate safeguard for the interests of urban telephone users does not explain the early repressive attitude of the Italian public authorities, nor does the mere extension of the telephone to the inter-urban service explain the similar attitude of the Norwegian public authorities. These events simply raised the question: can the telephone monopoly be best administered in the public interest by a policy of public regulation, or of public ownership? They do not explain the almost universal choice of the latter policy.

As a matter of fact, as has already been pointed out, the ownership of the telegraphs by the public authorities was the decisive factor in bringing about the transition to public ownership of the telephones. It follows, therefore, that although the private telephone companies often furnished an unsatisfactory service at an excessive price, the general abandonment of the policy of private ownership cannot be ascribed to that cause alone. Private enterprise can be condemned only upon being shown to have failed to give a satisfactory service at a reasonable price, when subjected to as effective public regulation as governmental authorities are capable of exercising. The historical truth is that the policy of private ownership under public regulation never had a fair trial.

CHAPTER XXII

COMPARATIVE TELEPHONE RATES

ONE of the first considerations in regard to a telephone system from the point of view of the subscriber is the price of service. Hence, after reviewing the development of the leading telephone systems on the Continent of Europe, the temptation is strong to compare the rates which are actually in effect in the various countries with a view to ascertaining which enjoys the cheapest service. The undertaking presents many difficulties.

In local exchange service the annual subscription paid by the subscriber does not necessarily indicate the actual expenses which he is called upon to bear. It is necessary to know not only what additional payments he is required to make, such as contributions towards the cost of construction, or charges on account of maintenance of his line and the installation of his telephone instrument, but also what services he is entitled to receive in return. Finally, it is necessary to know what standard of service is maintained. A bad service is dear at any price. But a high price does not always denote a good service. Under similar conditions, if rates are reasonable, a low rate denotes a low standard of service and a high rate a high standard of service. But the expenses of maintaining a given standard of service vary from country to country on account of differences in the cost of materials and especially in the cost of labor. Furthermore, the powers of telephone managements with regard to the use of rights of way over private and public property vary greatly from country to country. In some, rights of way are free, in others they are costly. Hence, a comparison of the prices, even for precisely identical services, affords no certain indication of their relative reasonableness.

Moreover, even if the conditions and standards of service were directly comparable, and the expenses of construction and maintenance identical in two different countries, it would not follow that any difference in the rates that might exist for an equivalent

service would measure the extent to which the higher rate was unreasonable. For both rates might be unreasonable, one unreasonably high and the other unreasonably low, or even both might be unreasonably high or low. A rate is unreasonably low if it fails to provide an adequate remuneration to the promoter of the enterprise. Governmental telephone rates are unreasonably low which enable telephone users to shift a portion of the cost of service to the shoulders of the general taxpayers. For example, the rates in Wurtemberg are lower than elsewhere in Germany. The standard of service in Wurtemberg is also on the whole lower, but even so the rates are unreasonably low.¹ Hence, it is a doubly indefensible proceeding to conclude that the rates in the rest of Germany are unreasonably high because higher than in Wurtemberg.

These difficulties make it practically impossible so to compare telephone exchange rates in different countries directly with one another as to reach any valuable conclusions concerning their reasonableness or unreasonableness. The preliminary allowances which must be made are too subtle, and the evidence on the basis of which such allowances must be calculated is not available in sufficiently accurate form. In the earlier period of the telephone industry, when the demand for telephone service was more homogeneous and the standards of construction less differentiated than at present, the single flat rates that then prevailed were more nearly comparable. Thus even with all due allowance for dissimilarities of conditions in Berlin and Paris in the middle of the '80's, the fact that the rate in the latter city was more than three times as high as in the former can only mean that the inhabitants of Paris were paying an excessive price for their telephone service. That they were still paying an excessive price for telephone service a score of years later is made manifest, however, not so much by a comparison with rates elsewhere, as by the direct evidence afforded by the history of the Paris exchange system itself. Since in general the unreasonableness of telephone rates can be ascertained with tolerable certainty by means of internal evidence alone, a comparative study of the existing schedules of

¹ *Verwaltungsbericht der württ. Verkehrsanstalten für das Jahr 1906*; Tabellen 33, 35.

exchange rates would be not only inconclusive but also superfluous.

A résumé of the conditions on which telephone service is rendered at the present time in the various countries will not be without value as an indication of the development of the business methods of the various telephone administrations. These conditions have been recently compiled by the International Telegraph Bureau at Berne.¹ In 1905 the flat rate was the only basis of charge for a direct line connecting the subscriber with the central office on the governmental telephone systems of Wurtemberg, Austria, Belgium, France (in cities with more than 80,000 inhabitants), Hungary, Luxemburg, Norway, the Netherlands, and Sweden, and on the private telephone systems of Denmark (in Copenhagen an additional charge in case more than 5000 conversations originate during the year from the same station), Spain, Italy, Norway (in Christiania an additional charge for calls in excess of 6000 from the same station in a year), the Netherlands and Sweden. The message rate was optional in Germany (the imperial telephone area), Bavaria, France (in cities with less than 80,000 inhabitants), and in Norway and Sweden (to a limited extent). In Switzerland the message rate was the only mode of charge.

The flat rate for a telephone station placed by the subscriber at the disposal of the public (such as telephones in restaurants, cafés, tobacconists, and so forth) was raised above the ordinary rate in the governmental telephone systems of Austria, Hungary and Luxemburg, and in the private telephone systems of Denmark and Spain. Reductions from the ordinary rates are made to the public authorities in Germany, Austria, Belgium, Spain, France, Hungary and Switzerland, to charitable organizations in Hungary, and to subscribers who rent more than one direct line in Belgium (partially), Hungary (Budapest), and in Norway. The subscriber's line is installed without charge to any distance from the central office in France (within the municipal limits of Paris and Lyons only), to a distance of not more than five kilometers from the central office in Germany (the imperial telephone

¹ *Tarifs tel.*, vol. ii, pp. 433-483.

area) and Bavaria; of not more than three kilometers in Wurtemberg and Spain; of not more than two kilometers in Switzerland, Austria (Vienna only), and Denmark. The subscriber contributes towards the cost of construction in Austria and in France. The flat rate varies according to the distance of the subscriber from the exchange in Belgium and the Netherlands. In Italy the rate varies according as the line is aerial or underground; in Norway according as it is composed of a single line with grounded return or of a metallic circuit, and in Sweden and the Netherlands (Amsterdam and Rotterdam only) according as the telephone is used by a business or residential subscriber. These factors are all important in the consideration of the comparative height of telephone rates. Differences in the length of line which are installed without extra charge are especially significant because the cost of construction of the line is an important item in the total expense of rendering telephone service. Consequently variations in the quantity of line which is included with the service obtained for the ordinary exchange rate materially affect the true height of the rate.

The telephone instrument is furnished free except in Austria, France, Norway (in some private exchange systems), Sweden (the subscriber pays an entrance fee both in governmental and private exchange systems), and Switzerland (the charge is higher during the first two years of the subscriber's contract). The subscriber's contract runs one year in Germany (imperial telephone area), Bavaria, Belgium and France, two years in Wurtemberg, and five years in Sweden. In the other countries no definite period is stated. The period of a conversation, local or long-distance, is five minutes in Bavaria, Wurtemberg, Belgium and Hungary (local conversations only), elsewhere three minutes. The rate for local calls at public pay stations is approximately two cents in Switzerland and in France (outside of Paris), two and one-half cents in all Germany and Sweden, three cents in Paris and Denmark, four cents in Austria, Hungary and Spain, five cents in Belgium, and six cents in Italy. The long-distance rates are graduated according to distance except in Luxemburg and the Netherlands. In Luxemburg there is a single rate for all distances, but graduated according as the conversation takes place between sub-

scribers or non-subscribers. In the Netherlands there is a single long-distance rate for the whole country, which is doubled for all communications taking place between 11.40 A. M. and 3.40 P. M. Urgent messages are charged triple rates throughout Germany and in Austria, Hungary and Norway, and double rates in Denmark, the Netherlands and Sweden. Reduced rates are given at night in Sweden, Denmark, France, Italy and Hungary. Throughout Germany a reduction of 50 % is given to subscribers who desire the same long-distance connection every day at the same hour. Reductions of an analogous nature are given in France (at night only), Italy (at night only), Spain and Belgium. All countries make provision for delivering and receiving telegrams by telephone at a small extra charge or free, and for summoning persons to public call offices at the request of subscribers or persons at other call offices. Both Germany and France make provisions for special night calls at offices where regular night service is not available.

In general the governments which have been in the telephone business longest — Germany and Switzerland — treated their subscribers in 1905 with the most liberality in regard to the conditions of the service. That is the most definite conclusion that can be drawn from a comparison of the subscribers' contracts in the various countries.

Outside of the countries the telephone systems of which have been studied most carefully, the development of the telephone rates on the Continent of Europe has been in general unmarked by features of particular interest. The most important fact is not whether the general level of rates is higher or lower in one country than in another. It is the capacity of a telephone administration so to differentiate its rates as to keep pace with the increasing complexity of the demand for telephone service. With the lapse of time, and the progress of the art of telephony, it becomes at once both desirable and possible to adjust rates to the finer differences in the use which ever widening circles of subscribers desire to make of the telephone service. By comparing the first and second editions of the *Tarifs téléphoniques* published by the International Telegraph Bureau, an idea can be gained of the extent to

which this process of change was carried in Europe generally during the decade which was bisected by the end of the century.

In Luxemburg the original flat rates were fixed by decrees of December 17, 1884, and March 9, 1887. In 1905 these flat rates were still in effect. In Belgium also the early flat rates were retained without change throughout the decade. In Austria and Hungary likewise no changes were made. In Spain and Italy the private companies were equally unprogressive. In the Scandinavian countries the multiplicity of local rates makes comparison difficult. It is certain at least that the old methods of charge were not abandoned. Only in the Netherlands is there a decided change. There the policy of municipal ownership infused new life into the local telephone business.

In the Scandinavian countries, however, there was less need for differentiation of rates than in countries in which the telephone business was developed from the beginning under a centralized management. The liberty originally allowed to local initiative established exchange rates on a basis that was well enough adapted to local needs. Further progress lay in the coördination of the early rates in order to form one harmonious system. To do this effectually the power of the state was indispensable, and in all three Scandinavian countries that power was exercised to a greater or less degree. In Sweden the government took the larger part of the business into its own hands and waged a vigorous contest with the General Telephone Company of Stockholm for the rest. In Norway the government also entered the field on its own account, but trusted to its example, as well as to direct action, to induce the private companies to develop their rates in harmony with the general progress of the industry. In Denmark the government preferred not to undertake the direct responsibility for the conduct of the telephone business, but, recognizing that monopoly of some sort was desirable, confided it to private companies. The government reserved in its own hands, however, complete control over rates. The policy of all three countries was to take up the task of looking out for a reasonable development of rates at the point where local initiative was unable to proceed further.

In the countries where the nature of the demand for telephone

service made local initiative from the very beginning less advantageous, the process of development was the reverse. In these countries progress lay in the change from original homogeneity to later heterogeneity. In some of these countries the early steps in this process were facilitated by the grant of concessions to private operating companies which adjusted their rates to the localities in which they established exchanges. This policy, however, proved satisfactory only in the initial stages of the industry. The greater the extent to which the early demand for telephone service was confined to the commercial classes, and the greater the extent to which the further development of the industry took place in response to a demand primarily for a better communication between different localities rather than between different persons in the same locality, the less adequate became the policy of concessions to secure the progressive readjustment of rates to the altered conditions. In the first place, it was impossible to grant to these companies the conditions of operation which were necessary in order to induce them to extend their operation into the less promising districts, and secondly a rate-policy calculated to secure the widest development of the use of the telephone conflicted with their interest in attaining the greatest possible monopoly profits. Hence, sooner or later in all such countries, the advantages of complete centralization in the management of the business became preponderant. Under the circumstances that have determined the development of the telephone business on the Continent of Europe, the concentration of its management in the hands of the central governments was inevitable.

These governmental telephone administrations are able to introduce modifications in the exchange rates with a thoroughness and on a scale impossible under any system of decentralized management. For example, in Austria the schedule of exchange rates established in 1887, when the government first became convinced of the necessity for playing an active part in telephone affairs, remained in effect unchanged for twenty years. This schedule was originally not ill adapted to the existing simplicity of the demand for telephone service. By 1907, however, in response to the increasing complexity of this demand, the Austrians decreed a

fundamental reform of their whole schedule of exchange rates. The old tariff resembled in many respects the French. The new subscriber was required to purchase his own instrument and to make an initial contribution toward the cost of construction of his line, intended to reimburse the telephone administration for its own outlay on that account. If the line was provided with a metallic circuit this contribution was increased by 50 %. No further initial contribution was required, but the ordinary flat rate comprised a fixed annual charge intended to defray the cost of the maintenance of the subscriber's line and instrument and that of the construction and maintenance of the general plant and of the service rendered by the exchange operator in effecting connections. These annual charges were higher in Vienna than elsewhere, and for lines intended to be used by the public generally than for those intended only for the use of the subscriber himself. Otherwise, there was little attempt to adjust the rates to varying individual and local needs.¹ The reorganization of the Austrian telephone rates was provided for by a decree of January 16, 1907.²

The new tariff is composed of flat rates, graduated according to the size of the exchange, and the nature and extent of the individual use made of the service by each subscriber. Exchange systems are divided into six classes:

- I. those containing over 20,000 subscribers;
- II. those containing from 5,000 to 20,000;
- III. those containing from 2,000 to 5,000;
- IV. those containing from 500 to 2,000;
- V. those containing from 200 to 500; and
- VI. those containing 200 or less subscribers.

Within the same exchange system the local service is divided into three classes: (A) direct business service; (B) direct residence ser-

¹ In case a subscriber wished to connect additional stations to his principal station, he was charged for the construction of the additional line and required to pay the annual flat rate on each additional station as well as on the principal station. If several stations were connected in series to the same line for the service of different subscribers, each was required to pay an initial contribution for his own instrument and for his share of the common line, but the annual flat rate was charged only once against the line as a whole.

² A. P. T., 1907, pp. 202-212.

vice; and (C) party lines. The class of business service is further subdivided into three sections: (1) those business lines on which originate from 6,000 to 12,000 calls per annum; (2) those on which originate from 3,000 to 6,000; and (3) those on which originate 3,000 or less. Party lines may contain (a) two, or (b) four subscribers' stations, but business houses are permitted to subscribe to two-party lines only. Telephone stations at hotels, cafés, etc., intended to be used by the general public are not permitted to be attached to any party line. The number of calls per annum which may originate on any direct line is limited to 12,000, and subscribers to stations on the two classes of party lines are restricted each to three fourths and one half of this number respectively. The limits within which the flat rate entitles the subscriber to the construction of his line without extra charge are variously defined for the various classes of exchange systems, and lines extending beyond the free local area are charged mileage fees on the excess.

Tariff of 1907

<i>Class of exch.</i>	<i>Limits of exch. area¹</i>	<i>Rates (kronen)²</i>					
<i>System</i>	<i>Km.</i>	<i>A 1</i>	<i>A 2</i>	<i>A 3</i>	<i>B</i>	<i>C a</i>	<i>C b</i>
I	6	500	400	300	240	180	100
II	4	400	320	240	200	145	85
III	3	320	260	200	170	120	70
IV	2	260	215	170	145	100	60
V	1½	215	180	145	130	90	55
VI	1	180	150	120	115	80	50

The rate for additional telephones in connection with a direct line serving one subscriber is 40 kronen when there are more than three such additional telephones. These together with the mileage charge for such telephone stations, when situated on separate premises, compose the schedule of rates applicable to private branch exchanges, and such special classes of service. The ordinary subscriber's contract runs for one year, but special contracts may be made for six months at 60 % of the annual rates.

In introducing this schedule the administration made special

¹ Distance from "central" in kilometers; longer lines are charged on the excess.

² 1 krone — a trifle less than 20 cents.

allowance to the existing subscribers for their contributions towards the cost of construction of their telephone connections, and thereafter such contributions were no longer to be required. The subscriber's use of his connection is recorded in each case. Party-lines are equipped with an automatic register. On other lines manual counts of the number of messages sent in a day are made on four separate days, one in each of the four seasons of the year. The average daily number of connections ascertained in this way for each station is multiplied by 300. The product is the official number of calls a year. If this product is not greater than 2,400, and the station is located in a residence, that connection is rated as a residential connection, but if the official number exceeds 2,400, the business rates are applied. In all cases where business rates are applied the official number is re-ascertained the second year by another enumeration. If the result corresponds with the first classification, the rating is made permanent for five years. After this period a new classification is made in the same way for another quinquennial period. If the classification of the second year does not coincide with that of the first, the station is temporarily put in the class ascertained last and the operation is repeated the next year. A permanent classification is then made by averaging the results of the three consecutive annual enumerations.

The Austrians have thus worked out a logical method of rate-making and applied it consistently. Its effect is to readjust automatically the price of telephone service to the local conditions governing its use by the subscribers in the same locality. In the actual schedule the adjustment of rates to differences in the quantitative use of the service is made only roughly, but the method employed gives the subscriber the advantage of knowing with certainty for at least one year in advance the size of his telephone bill. Moreover, the adjustment of the rate to the actual utility of the service in individual cases is made finer by the employment of certain external *indicia*. The reasonableness of the various rates of the schedule, however, further depends upon the accuracy of the computations on which the rates for different classes of service and for different localities were actually determined. If the expenses of construction and operation in large and

small exchange systems and for large and small users were accurately calculated, the new schedule would appear to respond tolerably well in the existing technical state of telephony to the peculiar Austrian needs. Whether the general level of the new schedule is reasonable or not, is, of course, another question.

It is interesting to compare these new Austrian rates with those which have been the result of the development of the telephone business in the United States. The purpose of such a comparison is not, of course, to consider the relative height of the telephone rates in the two countries, but only their relative range.

In the United States in 1902, the most recent date at which complete statistics of telephone operations have been published,¹ the average gross annual revenue per telephone in operation was \$37.50; per message 1.712 cents.² The highest general level of rates in any one state was in New York. The average there was \$66.47, and 4.541 cents respectively. The lowest was in Iowa. The averages there were \$16.35 and 1.016 cents respectively. In New York the number of large cities and the high density of population make necessary the maintenance of a generally high standard of service. In the great metropolis itself the standard of service is unquestionably higher than anywhere else in the world. In Iowa, on the contrary, the nature of the population and the character of their pursuits have brought about a more extensive use of the telephone than in the state of New York, but upon a simpler scale of construction and a less exacting standard of operation. The Iowa farmer who buys his material and instruments from a Chicago mail-order house, constructs his line with the help of the trees and fences along the route, and keeps it in order himself, does not need to pay much for annual operating charges.

In Austria there is no class of service that can be compared with the American independent farmers' lines, which connect the isolated households of the Middle West with the nearest village. The Austrian peasant lives in the village, and has no use for tele-

¹ The final report on the telegraphs and telephones of the United States in the year 1907 appeared too late for use in this chapter.

² "Telephones and Telegraphs, 1902;" Special Report of the Bureau of the Census, Department of Commerce and Labor, Washington, 1906, Table 36.

phone service of that sort. Moreover, the comparison is further vitiated by the fact that in Austria rural construction is not so much cheaper than urban construction as is the case in America; for in Austria the standard of rural construction, on account of the more compact construction of the villages and the preponderance of long-distance over local traffic, must be higher than in rural America. Nor do the average charges for two such states as New York and Iowa show at all clearly the true range of American telephone rates, striking as is the difference between the two figures. For New York, too, has a well developed rural service, though not commensurate in extent or character with that of Iowa. A more instructive basis of comparison between American and Austrian exchange rates is afforded by the schedule of rates established by some one American company which is in a position to fix the prices of telephone service in a homogeneous territory.

The company which best answers to this description is the New England Telephone and Telegraph Company. This company has always enjoyed a practical monopoly of an important territory. The nature of the demand, and the conditions under which the service is rendered in various parts of its territory are, however, sufficiently heterogeneous to require a considerable differentiation of rates. Moreover, since the expiration of the fundamental patents on the Bell telephone, the fear of competition has provided an incentive for a considerable amount of effort so to adjust the rates as to meet the various wants of its patrons. At the time the new Austrian rates were established, this company had over 300 different rates in force in different parts of New England,¹ but for the purposes of the present comparison, a reproduction of the schedules in force in the largest and smallest exchange systems respectively will suffice.

The largest exchange system is that of the metropolitan and suburban districts, and includes all of Boston and its vicinity. According to the regular published rates of this company in effect

¹ Communicated by the N. E. T. & T. Co. An attempt in 1906 to inaugurate competition in the city of Boston led to a special investigation of the rates of this company under the direction of the Massachusetts Highway Commission, resulting in October, 1910, in a number of changes.

on January 1, 1908, the maximum rate in this district was one of \$162 for a direct business line, entitling the subscriber to an unlimited service. In fact, the number of outgoing talks which would be permitted on any such line during any one year is limited, although no statement to that effect appears in the public schedule. This limit is placed at about 5,000 calls per annum and is not in itself unreasonable. The effect is to require larger users to rent additional lines, or make special arrangements with the telephone company. In New York City, where American telephone rate development has reached its highest point, telephone service is offered in any quantity at rates based on the number of messages, or rather on the number of blocks of a thousand or so messages and graduated according to the quantity contracted for. But in Boston the flat rate was maintained for the large users as late as 1908, and the interests of the telephone company, as well as the true interests of the large users themselves, were protected by the limitation of the quantity of traffic that might originate on any one line. For business users who did not care for an unlimited service, a direct line with a limited service was offered at \$78, for which the subscriber was entitled to 1,000 outgoing messages a year. For all calls in excess of that number he was required to pay three cents apiece, and each talk was limited to five minutes in length. Longer conversations were charged like separate calls. These were the maximum rates in force in the territory of the New England Telephone and Telegraph Company.

The minimum rates in force in this territory were those scheduled for places with a population of not more than 4,000. The flat rates for an unlimited service in these places were as follows:

<i>Line</i>	<i>Service</i>	
	<i>Business</i>	<i>Residence</i>
Direct	\$33	\$27
2 party	25	21
6 or more party	21	18

Mileage charges were made for line in excess of one mile from the central office for business connections and in excess of two miles for residential connections. The flat rates in force in places with 4,000 to 10,000 inhabitants, and in those with 10,000 to 20,000,

and so on, were arranged on the same basis. The maximum rates in each higher class of exchange systems steadily rose, but the minimum rates were kept at \$18, or as near that level as possible, by the introduction of less and less desirable classes of service, such as ten-party lines, or services limited in other ways. In the metropolitan district itself the lowest flat rate for a limited service was for a two-party line entitling each party to 500 calls at \$45 a year. Additional calls were charged for at the rate of five cents each. There was also, however, a four-party line coin-box service. For this service residential subscribers were charged five cents a call, with a minimum of \$2.50 a month (50 calls) or \$30 a year. This was the lowest rate in the metropolitan district.

Both in New England and in Austria the basis of charge was the flat rate graduated according to the size of the exchange system and the use of the service by the individual subscriber. The effect of the New England rates was that the maximum flat rate for an unlimited service in the largest exchange area was nine times as great as the minimum rate for a limited service in the smallest area, and that the range between the rates charged to the largest and smallest users in the metropolitan area itself was almost as great. In Austria the maximum rate is ten times as great as the minimum rate, and the range between the extremes in the metropolis is almost as wide as in New England. It must not be forgotten, however, that neither the maximum nor the minimum rates are paid for identical services in the two countries. If allowance be made for the mileage charges and the limitation of the so-called unlimited service, the difference between the range of rates in the two countries will be considerable.

On the other hand the difference in the range of the demand for telephone service in the two countries is also considerable. The party-line service especially is incapable of assuming the same importance in the Austrian as in the New England telephone system. Indeed, outside of Scandinavia, where both the natural conditions and the character of the population are favorable to the extensive use of party lines, that kind of telephone service has never become popular on the Continent of Europe. It is a matter of taste, as well as one of circumstances. Just as one cannot ex-

plain why the Englishman drinks tea when the German drinks coffee, so one cannot explain why the American tolerates a party line and the Austrian detests it. The average Austrian or German,—if one may use that convenient but indefinable term, which is even less applicable in Austria and Germany than in the land where it was invented,—the average Austrian or German, then, has a particular aversion to the use of a means of communication which keeps no secrets. Party lines on the American plan have been tried in more than one German-speaking country, but without securing a wide popularity. The people do not fancy such a service as do the Americans.

In Austria a system of party-line service was adopted that excluded all the other parties from the line when any one of them was conversing. But this system is more expensive than the ordinary party line, and the economy of its use is correspondingly diminished. The attempt has also been made to meet local needs for smaller quantities of service than can be economically carried on a direct line by the use of the automatic sub-exchange. This idea has been developed with the greatest energy in Bavaria.¹ There the purpose was not only to connect groups of urban residential subscribers who, having little use for telephone connection among themselves, possessed the common desire for speedier and more convenient communication with the neighboring urban exchange area. Such a system, for example, is admirably adapted for introduction in rural call offices. Since these rural users cannot usually afford to have a special line to bring them in direct connection with the city, there is ordinarily no alternative but to use the common terminal at the public call office. To connect themselves with this terminal by special local lines would convert the local call office into an exchange, and thus increase the expenses of operation. But the introduction of a semi-automatic switchboard at the terminal, in order to enable local users who desire a special service to make their own connection with the trunk line running to the city exchange, exactly meets the existing want.

The introduction of such a semi-automatic system is cheaper

¹ Steidle: *Tarif und Technik des staatlichen Fernsprechwesens*; München, 1906.

than the construction of a special line for each subscriber from the rural village to the city exchange, or the installation and operation of a manual switchboard at the rural public call office. It is also cheaper than a completely automatic local exchange, which would enable the parties connected to it to converse among themselves without the intervention of an operator in the urban exchange office. Since local communication is not wanted, there is no reason why the extra expense should be incurred. The difficulty with the system in its present state of technical development is that the service derived from it by each of the attached subscribers cannot be separately measured with accuracy, and hence there is no satisfactory basis of rates for such service. The rates ought to take into consideration the time the common trunk to the city is occupied by the individual subscriber attached to the semi-automatic terminal, but this is not yet technically practicable except at a disproportionately great expense. Even without such a semi-automatic substitute for the ordinary party line, or private branch exchange, the Austrian schedule of rates as a whole is tolerably well adapted to the peculiar Austrian needs.

The objection to the Austrian schedule of rates in its existing form is that in a given locality the graduation of rates with a view to the varying needs of different members of the same class of users is too rough. This is the defect of any system of charge that is based solely on the principle of flat rates. Such a system needs to be supplemented by special measured-service rates, as is actually done in New England by the introduction of a large variety of limited flat-rate services, with a message rate for calls in excess of the stipulated limit. In meeting the wants of small users the public call offices are capable of rendering a comparatively greater service in Austria than in America, and their more extensive introduction, especially of the pattern known as automatic pay stations, such as have been introduced in Germany since 1900,¹ would go far towards filling the gap in the existing Austrian service. Under the existing conditions, this class of traffic is largely effected through the stations rented by the numerous small restaurant, café and tobacco-store keepers, and so forth, who

¹ *Verwaltungsbericht (Württemberg)*, 1889, p. 83.

place their telephones at the disposal of their customers. The convenience afforded by this means, which is in reality nothing but an advertising device on the part of the proprietors of such establishments, is not conceivable in America, because the custom of patronizing such places is unknown on a scale at all comparable to that in Germany and Austria. The more compact construction of the residential portions of continental cities not only diminishes the total demand for residential service, but makes it easier to meet the demand that exists by methods that would be far less adequate in New England.

Nevertheless, on account of the failure to introduce a more accurately measured service, the Austrian reform of 1907 cannot be considered so successful an approximation to the ideal as the proposed German reform. Neither the Austrian nor the German tariff contemplates so wide a variety of service as that of the New England Telephone and Telegraph Company. On the other hand, so wide a variety of service is not required. In practice, the more logical German and the more numerous New England rates work out to about the same result, except that the German, unlike the New England and the Austrian, make no distinction between business and residential subscribers. The discrimination between business and residential subscribers in favor of the latter is a measure calculated to increase the utility of the telephone service as a whole, and is for that reason a desirable feature of a system of rates. Yet on the whole, when consideration is taken of the fact that the differentiation of the demand for telephone service began later and has proceeded less rapidly in Germany and Austria than in New England, the subscribers to the telephone services of the German and Austrian governments have as little cause to be dissatisfied with the progress that has been made in the differentiation of the rates and service that are offered them, as have the New Englanders with the varieties of service and rates offered to them. As has been said before, this statement is not intended to imply that the general level of rates may not be unreasonable either in Germany, or in Austria, or in New England,¹

¹ For detailed discussions of the reasonableness of the rates of the N. E. T. & T. Co., cf. Reports of the Massachusetts Highway Commission, 1907, 1908, 1909.

or in all of these places. The point simply is that in so far as concerns the adjustment of the supply of telephone service to the demand in these different places, there is little reason, as matters stood in the year 1909, for commending the schedules of one of these managements more than that of another.

The objections which apply to the direct comparison of the general level of exchange rates in different telephone systems apply less forcibly to a similar comparison of long-distance rates. In this branch of the industry the nature of the service rendered and the basis of the charge are practically the same under all systems. The general difficulties of making such a comparison arising especially from differences in the cost of material and labor in different countries remain, however, as formidable in the one case as in the other. Nevertheless, by contrasting comparative long-distance rates in two countries with comparative rates for another service rendered under equally analogous conditions, some light may be thrown upon the relative reasonableness of the long-distance rates themselves. The most serviceable European governmental long-distance rates for comparative purposes are those of the new schedule proposed in 1908 in Germany. These rates are in all probability reasonable. The only American rates which are available for comparison are those of the American Telephone and Telegraph Company.

These rates are stated in the printed schedule of the American Telephone and Telegraph Company. The unit of time for a long-distance conversation is three minutes, both in the United States and in Germany. In the former country talks of longer duration are charged at about one-third of the rate for the first three minutes for each additional minute. In the latter the rate for the three-minute period is not subdivided. In both countries the distance is the decisive factor in determining the rate. At the bottom of the schedule of toll-rates stands the local public call-office rate. This is 2.38 cents in Germany and five cents in America, or about twice as much as in Germany. The German long-distance rates work out to from .08 to .12 cents a mile. The long-distance rates of the American Telegraph and Telephone Company are fixed on a basis of .6 cents a mile. Hence, at the upper end of the sched-

ule, a message in America costs from five to seven and one half times as much as a corresponding message in Germany. Thus the divergence between the American and the German rates is much greater for the long-distance than for the local traffic.

Now, there seems to be no reason from the technical standpoint why this should be the case. The difference between the prices of labor and of materials in the two countries does not vary according to the length of the line. Ordinary money wages in the United States are from two to four times as high as in Germany, according to the nature of the occupation and the locality. The price of copper, on the other hand, the most important material in the construction of long-distance telephone lines, is higher in Germany than in America by the cost of transportation of the raw material from the American smelter to the German wire manufacturer. The difficulties of construction do not increase, as the distances increase, more sharply in America than in Germany. Since the German rates in their latest form are equally remunerative throughout the entire scale, it would seem that the American rates are either unreasonably low for short distances, or unreasonably high for long distances. The mere assertion, taken alone, that the price of a long-distance talk between New York and Chicago costs seven times as much as a similar talk in Germany means nothing to a person who is conversant with the circumstances under which the service is rendered in the two countries. But the fact that the ratio between the prices of such a talk in America and in Germany is more than three times as great as that between a local talk in the two countries is one the explanation of which would be desirable.

In order to distribute traffic as evenly as possible throughout the twenty-four hours of the day and thus economize in the use of costly plant, the American Telephone and Telegraph Company reduces the rates at night to one half of their level by day. The German telephone administration, with the same object in view, reduces the night rate to one half of the day rate for talks which are held regularly at the same time between the same persons. Otherwise, the day rates remain in force. In general, night service is not so widely extended in Germany as in America, chiefly

because the use of the telephone for other than business purposes is not so widely extended. The further extension of the night service is, however, a part of the regular policy of the German telephone administration.¹ Besides the reduced subscription rate for night service, the administration seeks to promote the more even diffusion of day messages, and thus the more economical use of its plant, by the encouragement of the use of the service during the hours when the normal demand for long-distance connections slackens. These hours are before 9 A. M., between 7 and 9 P. M., and between 12 and 3 P. M., and all day on Sundays and holidays. The busiest hours in America are not precisely the same, but the business habits of the Germans throw the bulk of the load on the wires between 9 A. M. and noon, and between 3 and 7 P. M. Consequently the existing plant is only partially utilized during the other hours of the day.²

During these hours the use of the long-distance service is extended to all the places of lesser commercial importance which are not permitted to call for long-distance connections during the busy hours. The effect of this arrangement is to restrict to a certain extent the use of the long-distance plant during a portion of the day, but at the same time to secure a greater economy in its use than is secured in America. The Germans act on the theory that telephone users have no more right to expect the line to be waiting for them whenever they desire it than travelers have a right to expect the express train to bide their will. In those places where the demand for long-distance communication is heaviest, the most abundant supply of facilities for handling the traffic is made available, and in those where the demand for the service is more irregular and uncertain, the casual user is required

¹ Uninterrupted night service was first introduced into the Berlin exchange system in 1899 and into Cologne in the following year. In 1906 uninterrupted night service existed in 29 places in the imperial telephone area, and partial night service in 55. RPT Ergebnisse, 1901-05, p. 54. In Munich and Stuttgart uninterrupted night service was introduced in 1901. Verwaltungsbericht (Württemberg), 1901, p. 85. Elsewhere, in Wurtemberg at least, local exchange connections can be secured between 10 P. M. and 6 A. M. for any length of time for 20 pf. (under 5 cents).

² *Bestimmungen für die Benutzung der Anschlüsse an staatliche Ortstelephonnetze.* Generalldirection der Kgl. Bay. Posten und Telegraphen. München, 1906, §26.

to arrange for his conversation during one of the hours when the use of the line is less generally desired. The American Telephone and Telegraph Company, with a similar object in view, makes special rates for the regular use of a long-distance line at hours when it is not so much in demand for ordinary traffic.

The danger in these attempts to economize in the use of the plant is that they will be overdone and, that instead of true economy, an inadequate service will be the result. The German authorities possess an automatic arrangement for warning them of this danger. They permit desired connections to be registered in advance, and then make them in the order of registration. It is provided, however, that subscribers whose business is urgent, may secure priority for their connections by paying triple the ordinary rate. This is the "urgent" rate which has been previously alluded to, and is unquestionably a reasonable as well as a useful device. It was originated in the telegraph service before the telephone was invented,¹ and was extended to the latter service as soon as the long-distance traffic began to develop. This urgent-rate service is also available in Germany to long-distance telephone users in places of secondary commercial importance who do not wish to wait for their connection until the arrival of the less busy hours.² In general, the ratio of urgent messages to ordinary messages is low. In Bavaria, in 1907, the proportion of urgent messages was one per cent on the long-distance telephone, and three-fourths of one per cent on the telegraph service.³ When the ratio on any line rises, this fact is interpreted by the telephone administration as an indication that the line is becoming inadequate to the demands that are made upon it, and that additional facilities should be arranged for at once.

By these means the German telephone administration secures a greater economy in the use of its plant than does the American Telephone and Telegraph Company. The American pays more than does the German for the traffic over the longer distances for

¹ Schöttle, pp. 79-88.

² *Statistischer Bericht über den Betrieb der Kgl. Bayer. Posten und Telegraphen im Verwaltungsjahre 1906*, p. 4.

³ Communicated by the Bavarian telephone authorities.

the sake of having more spare plant available in order that he may effect a connection as promptly as possible after he has made up his mind that he desires it. The policy of the German telephone administration encourages the user to plan his conversation as far as possible in advance and, by way of compensation, effects a real saving in the cost of the service. To a certain extent this fact contributes towards the explanation of the discrepancy between the local call-office rates and the long-distance rates in America as compared with Germany. An adequate explanation, however, could be obtained only by special examination of the finances of the American Telephone and Telegraph Company.

On the whole, the Germans have little reason for dissatisfaction with the policy pursued by their telephone administration in regard to the rates. The rates are not wholly above criticism. Indeed, it is not in the nature of rates for a growing business, especially for a business in which the progress of invention is constantly altering the conditions under which it is carried on, ever to be wholly above criticism. But with the methods employed by the German telephone administration to keep its rates in harmony with the ever changing relations between the demand for and the supply of the service, the German telephone users are justifiably contented. When a portion of them feel their interests injured by any rate, or lack of a rate, they complain, and they are expected to complain. Thus these complaints are in reality nothing but the evidence that a part of the administrative organism is operating as it is intended to operate. They should not be confounded with genuine expressions of dissatisfaction over the German system of public ownership of the telephone business. The results of that system, so far as concerns the rates for telephone service, will bear comparison with the results that have been accomplished anywhere.

CHAPTER XXIII

COMPARATIVE TELEPHONE DEVELOPMENT

THE policy of public ownership of telephones is now established throughout the greater part of the Continent of Europe. Only Spain and Denmark, among all the countries which originally declined to adopt that policy, still cling to the alternative of private ownership. The transition has only recently been completed in Italy and is still under way in the Netherlands, Norway and Sweden. In Germany, Switzerland, France, Belgium, Austria and Hungary, however, the governmental monopoly of the telephone business has been exclusive for more than a decade at the least, and in the first two of these countries for a whole generation. What are the results which have been accomplished by public enterprise in the telephone business?

Writers on the subject of public and private ownership of such business undertakings as the telephone are wont to compare the magnitudes of the business in different countries under different forms of ownership, with a view to deducing from the statistics of development under each of the two forms general conclusions in regard to their respective expediency. Such writers argue on the assumption that the merit of a policy of ownership is indicated with sufficient accuracy by the quantity of facilities which are created, or by the extent to which they are used. This assumption is not altogether accurate. The purpose of any business undertaking is not to create facilities, but to satisfy a want. The creation of facilities is merely a means to that end. The test of the efficiency of a system of industrial organization is not the quantity of facilities created. Too many facilities can be created as well as too few. The test is the quantity of satisfaction which is derived from the use of those facilities. And in passing judgment upon the record made by any business management, the critic must consider not only the quantity of satisfaction which the undertaking has yielded, but also the extent to which the com-

munity in which the service was rendered was capable of deriving satisfaction from it. The problem therefore is not a physical one, but a psychological one.

The precise measurement of the satisfaction which a community derives from such a service as the telephone is wholly impracticable. Statistics are not capable of dealing with such a psychological problem. The most that can be done is to take certain external indicia as the basis of measurement. The satisfaction which different individuals in the same community derive from the telephone service is roughly indicated by the amount of money which they are willing to spend for it. This index, however, is not strictly accurate, because, if the rates should be raised, different telephone users would curtail their use of the service to an unequal extent, according to the various degrees of utility which they set upon their more urgent telephonic communications. The satisfaction which different communities derive from their service is not indicated at all accurately by the amounts of money which they spend for it. For the general level of prices, and the level of telephone rates in particular, may be variously affected in different communities by a variety of causes. Wages, prices of materials, expenses for rights of way, and so forth, vary greatly from place to place. A better index of the value set upon a telephone service by the community as a whole is the use that is made of it. A fairly accurate measure of the use of a service is the number of talks that are carried on in a given period. The measure would be made more nearly accurate by weighting the talks according to the distance covered or the time saved by them. This degree of accuracy unfortunately is wholly impracticable. Even the total number of talks that take place is ascertained with exactness in only a few countries, and in those few the records of local talks consist largely of rough estimates until within the last few years. There remains therefore as a practicable method of measuring the utility of the telephone service to the public in the various countries only the comparison of the quantity of telephone equipment in use. The most frequent and, on the whole, the most instructive basis of comparison, is the number of stations connected with public exchange systems. The ratio between the

number of stations and the number of the population in any country is named the development.

"A judicious man," says Carlyle's 'crabbed satirist,' "looks at Statistics, not to get knowledge, but to save himself from having ignorance foisted upon him." Statistics have improved somewhat since Carlyle's day. Those published by the International Bureau of Telegraph Administrations at Berne, Switzerland, are carefully compiled and edited. Yet they are no better than their source, the reports of the various governmental administrations. A judicious man will still be careful what he tries to prove by them.

The statistics of telephone development in various countries indicate with tolerable accuracy the comparative magnitudes of the business. But too much significance must not be attached to them. The quantity of wire per telephone, the number of messages per telephone, the cost of service per telephone, the utility of the service per telephone, all vary to different extents from country to country according as the exchange systems serve a sparse or a dense population, according as they contain a large or small proportion of party lines or private branch exchanges, according as the rates are fixed on the basis of the number of instruments rented, or on that of the number of messages sent, according as the saving of time and expense by the use of the telephone is great or small. Moreover the method of comparison based on the number of telephones in use in proportion to population fails to make due allowance for the greater utility of public call offices in some countries than in others. One public call office easily accessible to a large number of telephone users, and affording them the particular kind of service they desire, really gives more satisfaction to the community than several private stations. In short, the statistics of telephone development can only indicate roughly the satisfaction which a community derives from the service. Considered apart from the circumstances under which the service is rendered, they indicate nothing as to the comparative efficiency of different methods of industrial organization.

The following tables show the telephone development of the more important countries on the Continent of Europe at two early dates in the history of the industry:

Country	Population per Telephone	
	1885 ¹	1895 ²
Switzerland	560	129
Norway }	1,100	115 ³
Sweden }		
Denmark	1,280	— ⁴
Belgium	1,620	682
Luxemburg	1,740	160
The Netherlands	1,860	615
Germany	3,050	397
Italy	3,500	2,649
France	5,250	1,216
Austria- }	12,200	{ 1,318
Hungary }		
Spain	28,100	— ⁴

In 1885 the greatest development was in Switzerland. Both the high degree of intelligence of the inhabitants and the natural characteristics of the country were especially favorable to the early use of the telephone. Moreover the method of coöperation between central and local authorities employed by the Swiss telegraph administration was well adapted to make the new service available to the widest circle of users with the greatest rapidity. The other telephone systems which were managed by the public authorities in 1885 were those of Luxemburg, Germany and Spain. The Spanish government had done nothing but establish a few lines for official purposes only, and in the next year handed the business over to private enterprise. In Germany the exchange systems were wholly confined to the large cities. They had not yet penetrated to the smaller cities, to say nothing of the rural districts. In Luxemburg the government only went into the telephone business in 1885, but it had already adopted the policy of making the telephone system a territorial instead of an urban institution, and was extending its toll lines into all the rural villages as rapidly as possible.

¹ End of year. A. P. T., 1887, pp. 673, 710.

² Beginning of year. J. T., 1895, p. 119.

³ Sweden only; figures for Norway not available.

⁴ Private companies only; no reports: hence figures not available.

The development in the Scandinavian and North Sea countries, where private enterprise held sway, was inferior to that in Switzerland, but surpassed that in Germany. The causes of the rapid development in these countries under private enterprise were not the same in the Scandinavian as in the North Sea countries. In the former the policy of granting free play to local initiative was excellently adapted to the general character of the people and of the land. It unquestionably gave an impetus to the early development of the telephone business which would have been impossible under any form of centralized administration. In Belgium and the Netherlands the comparatively large proportion of the population living in cities made those countries a peculiarly favorable field for early telephone operations. For except in Scandinavia, the telephone exchange found its first and for some years its only field of usefulness on the Continent of Europe in the large cities and among the commercial classes.

In Switzerland and Germany it had already begun to be extended to the rural districts, — at first, however, not in the form of local exchange service, but as a substitute for the telegraph. This was a use of the telephone which under the existing circumstances could have been brought about only by the public authorities, since the telegraph business had never been undertaken by private enterprise. In Italy, France, Austria and Hungary, in 1885 the telephone business was carried on by private enterprise. The telephone had not come into use in the rural districts of these countries, and in the large cities differences in the demand were of much less importance than they became later with the extension of the service to other classes of the community. Under these circumstances a comparison of the urban development in different countries can throw considerable light on the effects of different policies in the management of the business.

Of the three great capitals of Continental Europe in 1885, the greatest development was in Berlin (32.7 telephones per 10,000 inhabitants); next came Paris (14.2 per 10,000), and finally Vienna (7.9 per 10,000).¹ The general conditions were much the same in

¹ A. P. T., 1887, p. 675. Jan. 1, 1907, the development in Berlin was 423, in Paris 213, and in Vienna 160 per 10,000 inhabitants.

all three cities. Each possessed a pneumatic-tube service and good local postal facilities. Hence it is reasonable to conclude that the city in which the public authorities had the enterprise to supply the service from the beginning as a public undertaking enjoyed the most extensive telephone system, because that policy was better than the one of granting a concession, under terms calculated to protect the public telegraph revenues, to a private company.

A factor in the early development of the telephone service in a number of cities on the Continent of Europe was competition. Wherever competition prevailed, the result was a temporary impetus to telephone development. The managers of competitive undertakings are led by their own self-interest to strain every nerve to bring the merits of their respective services to the attention of possible customers in advance of their rivals. The effect of these campaigns of popular education is that the public is taught to appreciate the utility of the proffered service more quickly than if it were left to discover the merits of the service for itself. Under public ownership, on the other hand, the officials in charge of a business undertaking consider that their duty is performed when they have placed at the disposal of the community those facilities which it declares it wants. They do not feel that they should attempt to teach the community what it ought to want. That task is confided to others. Thus, Stephan considered it an unusual exploit when he secured the first subscribers to the Berlin telephone exchange by dint of personal solicitation. In general, the public authorities leave the community to discover the utility of the telephone service in the same way as that in which it discovers, for example, the utility of a water supply, and trust to the general educational system and standard of intelligence to give to the community the intellectual alertness which is the best safeguard of a wise use of the one as of the other. Consequently competition, while it lasts, gives an exceptional impetus to telephone development. Competition existed temporarily in the early period of the telephone industry in a number of the leading cities of Italy, as well as in Brussels, Christiania, Stockholm, and many smaller places in Scandinavia. Unques-

tionably it was a factor in the early progress of the industry in those countries.

A decade later, however, competition except in Sweden had become a thing of the past. Italy dropped back into the place to which she was entitled both by the character of her population and by that of her legislation. The countries in which others besides the commercial classes had found a use for the telephone were far in the lead, and for the lack of such other classes, Belgium and the Netherlands were dropping behind. The small democratic countries in which the government was near to the people, and those in which local initiative had enjoyed the freest play, were the ones to make the best showing at this stage of the development of the industry. But the period of the superiority of the centralized over the decentralized management was approaching. In Sweden the transition was already made, in the rest of Scandinavia the government had already found it impossible to leave private enterprise and local initiative altogether uncontrolled. By 1895 private enterprise had given place to public throughout Europe except in Scandinavia in the North, and in Spain and Italy in the South. In Holland also private enterprise still held the field, but the beginning of the transition was imminent. In the central portion of Western Europe the gap was widening between the development of the well-organized telephone system of Germany and that of the less efficiently organized system of her rival France. The city of Berlin alone possessed more telephones than the entire French republic.

The rapidity with which the telephone could be introduced by a capable and enterprising public administration, supported by an intelligent and democratic community, is well illustrated by the example of Switzerland. Already, before the abolition of the universal flat rate by the Swiss in 1889, the development in the urban areas where the exchange service gained its first foothold was greater than that in the urban areas of the neighboring Republic of France a score of years later. It was also greater than the contemporaneous urban development in Germany, although the German rate (Mks. 150=\$35.70) was not much higher than the Swiss (Frs. 150=\$28.95). The actual development in the

three cities of each country which made the greatest use of the telephone at that time was as follows:¹

	City	Population	No. of Subsc'rs	No. of Telephones per 100 inhabitants
Switzerland	Geneva	68,000	1,572	2.3 %
	Zurich	75,000	1,109	1.5
	Basel	61,000	947	1.5
Germany	Frankfort	103,000	593	.57
	Hamburg	450,000	2,144	.47
	Leipzig	149,000	598	.40

Public enterprise in Switzerland brought the telephone into more extensive use in a shorter time than was done anywhere else in Europe by any kind of enterprise.

At the present day the forces the operation of which could be observed in 1895 have worked much further. The telephone development according to the most recent available statistics is as follows:²

Country	Subscribers' stations	Public pay stations	Total	Development per 100 inhabitants 1906
1 Sweden	$\left\{ \begin{array}{l} 39,505 \\ 971^8 \\ 44,512 \end{array} \right\}$	1,306	136,294	2.57
2 Denmark	$\left\{ \begin{array}{l} 727 \\ 61,144 \end{array} \right\}$	$\left\{ \begin{array}{l} 129 \\ 1,227 \end{array} \right\}$	63,227	2.44

¹ *Cochery Rapport*, 1880, pp. 82, 83. After nearly a score of years had passed, the efficiency of the German administrative system and the genius of her organizers had regained much of the ground lost at the start to the more favorably situated (*i. e.*, from the standpoint of the demand for telephone service) Swiss. The development in the same cities on Jan. 1, 1907, was as follows:

	Population	No. of subscr's	Development
Geneva	111,000	5,752	5.15 %
Zurich	170,000	8,342	4.60
Basel	121,000	5,008	4.15
Frankfort	334,900	16,054	4.78
Hamburg	803,000	36,217	4.50
Leipzig	502,500	14,608	2.91

² J. T., *Statistique Générale de la Téléphonie*. Année 1906. Berne, 1908. Figures in Roman type are those of the governmental systems. Figures in italics are those of private companies.

³ Mutual telephone systems.

Country	Subscribers' stations	Public pay stations	Total	Development per 100 inhabitants 1906
3 Norway	{ 17,453 25,120 }	{ 1,159 1,485 }	45,217	2.03
4 Switzerland	59,273	1,107	60,380	1.82
5 Germany	668,148	31,654	699,802	1.15
6 Luxembourg	2,527	208	2,735	1.11
7 The Netherlands	{ 1,990 21,394 ¹ 13,490 }	{ 356 153 93 }	37,476	.66
8 Belgium	30,448	163	30,661	.42
9 France	152,072	9,442	161,514	.41
10 Austria	58,558	806	59,364	.22
11 Hungary	{ 32,538 40 }	1,277	33,855	.17
12 Italy	{ 1,558 34,660 }	{ 126 901 }	37,245	.11
13 Spain	{ 500 17,200 }	{ 27 ² 16 }	17,743	.09

However, the telephone is only one of a number of means of transmitting the communications of a nation. Before attempting to draw any conclusions from these statistics they should be compared with those of the other means of public communication, the governmental postal and telegraph services: ³

Rank acc. to no. of tels.	Country 1906	Density of population no. per km.	No. of letters & p. c.'s delivered per capita	Rank acc. to letters & p. c.'s.	Rank acc. to pld. mls.	Rank acc. to telegrams	No. of tels. del'd p. 100 cap.	No. of inter-urban talks p. 100 cap.	Rank acc. to long distance talks
1	Sweden	12	27.8	9	8	11	38.2	202	6
2	Denmark	65	47.9	3	4	8	48.6	316	3
3	Norway (1905)	7	23.2	10	9	3	81.8	214	4
4	Switz'land	80	74.5	1	1	2	83.2	211	5

¹ Municipal telephone systems.

² One station was in the hands of the government; the others were owned by the private company which has a monopoly of the long-distance business.

³ Reichs-Post- und Telegraphen-Verwaltung: Statistik für das Kalendarjahr 1906.

⁴ Letters and postal cards delivered by governmental postal service.

⁵ Printed matter delivered by governmental postal service.

⁶ Exclusive of international and transit telegrams.

5 Germany	112	61.8	2	3	5	71.5	371	2
6 Luxemburg	95	45.5	4	6	7	50.6	715	1
7 Neth'lands	171	35.1	7	7	4	77.1	41	8
8 Belgium	246	36.5	6	2	6	71.1	18	9
9 France	73	32.0	8	5	1	108.2	45	7
10 Austria	87	40.2	5	11	9	45.3	7	10
11 Hungary	59	19.2	11	12	12	37.6	5	11
12 Italy	116	11.0	12	10	10	38.7	5	12
13 Spain								
(1905)	36	11.0	13	13	13	22.3	— ¹	— ¹

When all the modes of transmitting intelligence are taken into consideration, Switzerland stands easily ahead of all the other countries on the Continent of Europe. The high development in Switzerland is stimulated by the army of tourists which invades the country every year. Yet without this exceptional source of traffic, the high average intelligence of the Swiss, their democratic spirit and their general manner of life, would give rise to a greater use of the facilities for transmitting intelligence than in countries of lower standards of living.

Next to Switzerland stand the Scandinavian countries. They are also the countries which next to Switzerland show the least development of social inequality, the highest average intelligence and the most even diffusion of wealth. The spirit of true democracy is perhaps less highly developed in some parts of Sweden than in Norway and Denmark. Norway particularly is a land of insignificant industrial development and of an exceptional degree of social equality. The long distances in that country, as well as in Sweden, have stimulated the development of the means of long-distance communication, whereas in Denmark the shorter distances have prevented the telegraphs from sharing in the prosperity which has come to the telephone. In Sweden, the policy of the telegraph administration has clearly tended to favor the long-distance telephone at the expense of the telegraphs. The latter not only are used much less than in the rest of Scandinavia, but scarcely more than in Sweden itself a quarter of a century ago. All the increase of long-distance traffic in Sweden since the intro-

¹ Private company, no returns.

duction of the telephone into the general telegraph system of the country has fallen to the share of that branch of the service.

None of these countries, however, can compare with Germany, or the little principality of Luxemburg, on the score of long-distance telephone traffic. The explanation is to be found in the high development of that which may be called the short long-distance traffic in those two countries. This is the traffic between rural villages and the small country cities which serve as distributing centers of everything which the surrounding country cannot produce for itself, from general merchandise to the news of the world. The sort of intelligence which under these circumstances travels by means of the local rural toll-lines would in Scandinavia travel to a much greater extent over long private party-lines, and be classified as local exchange service rather than as long-distance. The German telephone administrations, especially since 1898, have pursued the policy of stimulating the expansion of this sort of traffic with all the means at their disposal. They are now trying to accomplish throughout the broad German Empire what the Luxemburg administration under the simple conditions which prevail in its territory was able to bring to pass in a comparatively short interval.

Since the beginnings of telephony in Luxemburg, subscribers to exchange systems have been allowed to use the toll-lines for conversations with other subscribers anywhere within the limits of the principality without further charge.¹ The subscriber is not even required to use his own instrument, but may call another subscriber from any public call office without further charge. Only in case the user of a public call office is not a subscriber is he required to pay, and even then the charge is lower if the other party to the conversation is a subscriber. Villages in which there is no demand for a local exchange system are encouraged to connect themselves with the general toll system of the grand duchy by the establishment of village call offices. For these they are required to pay the same mileage charges as private subscribers, and to provide a location and attendance for the station. An unlimited service is then rendered for an annual flat rate which is 25 % higher

¹ *Tarifs 1881*, vol. II, pp. 230-236.

than that charged to ordinary private subscribers. In a small country inhabited by a homogeneous and independent population, at least so far as concerns its means of gaining a livelihood, these conditions were admirably adapted to promoting an early and extensive use of the telephone. The Luxemburg government showed that it had analyzed the needs of its people rightly when it introduced the telephone in 1884 in the way that it did.

It is a similar extension of the local rural urban service which during the later period of the telephone industry has received so much attention from the German telephone authorities. The private operating companies in Denmark, which have been given monopolies in areas in general not unlike Luxemburg in size and population, but in other respects more favorable to telephone development, have also built up a considerable business of the same sort. In Denmark, however, the commercial toll traffic over longer distances has not attained the importance of the similar class of traffic in Germany on account of the absence of commercial centers in Denmark outside of Copenhagen. This class of traffic in Denmark is chiefly in the hands of the government, which carries on the toll business between the areas of the different operating companies, and amounts to about one-seventh of the total. In Germany the proportion must be more considerable than that. Indeed, the German demand for toll connections between large commercial centers more closely resembles the similar demand in America than is the case in the other Continental European countries. For Germany has a greater number and a wider distribution of commercial and industrial centers than has any of the other European countries. Not only in Scandinavia, but also in such countries as France, Austria and Hungary, the political capital is also the unchallenged commercial and industrial metropolis.

Between the countries already mentioned and the others there is a wide gap in the extent of telephone development. When all the means of transmitting intelligence are taken into consideration, those countries with the lowest general standard of living — Hungary, Italy and Spain — still stand far below the others. In Hungary, where the telephone has been a governmental undertak-

ing for a score of years, the development is somewhat better than in Italy and Spain, where the conduct of the business has been mostly in private hands. However, the other means of transmitting intelligence are also somewhat more highly developed in Hungary, although equally in all three countries in public hands.

The statistics of comparative development taken by themselves afford no basis for estimating the comparative efficiency of different telephone administrations, or the comparative wisdom of different telephone policies. Too many factors besides the policy or the capacity of the administration affect the growth of the business. It is only after a special study of the circumstances in each particular case that a criticism of the management of the business gains any additional force by the quotation of statistics. For example, in France a larger proportion of the increase of long-distance traffic during the generation since the invention of the telephone has fallen to the telegraphs than in the other European countries. The explanation lies in the fact that the development of the telegraph system has been in the hands of a centralized management, whereas the responsibility for the long-distance telephone system has been left to local initiative. This policy was mistakenly pursued long after the stage had been passed in which the advantages of local initiative had ceased to predominate over those of a centralized management. In this case a quotation of the statistics serves to give clearness to a general statement which is founded on evidence of an entirely different kind.

The greatest European telephone system, and on the whole, when all the circumstances are taken into consideration, the best, is that of Germany. It is also the one which can with the most propriety be compared to the telephone system of the United States. The extent of the country, the size and economic development of its population, the variety and importance of its industry and commerce, all combine to make such a comparison an interesting undertaking. The most recent published statistical account of the telephone industry in the United States is that made in 1902 by the Bureau of the Census.¹ The growth of the industry since

¹ *Telephones and Telegraphs, 1902*, Department of Commerce and Labor, Washington, 1906. A fresh enumeration has been made for the year ending Dec. 31, 1907,

that date has been enormous in both countries, but unfortunately the annual reports of American telephone companies are so incomplete as to be worthless for purposes of comparison with the German official statistics.

In 1902 there was one telephone for each 34 persons in the United States, and one for each 128 in the German Empire, or, exclusive of public call offices and official stations, one for each 148. Thus relatively to the population, telephones were about four times as numerous in the United States as in Germany.

In the large cities in America, the development was about the same as in the country as a whole. In New York the number of inhabitants per telephone was 39, Chicago 30, Philadelphia 29, St. Louis 31, Boston 19, Baltimore 35. In Germany the development was much greater in the large urban areas than in the Empire as a whole. The figures for the Berlin postal district (which comprises the metropolitan and suburban area known as Greater Berlin) show that the development was 43 persons per telephone, in the Hamburg postal district 52, that of Frankfort 77, and of Cologne 89. In the city of Munich the development was 39, in Nuremberg 41, and in Stuttgart 30. The Wurtemberg capital led the Empire, but the actual urban development in the imperial postal area was at least as great as in Bavaria, if allowance be made for the lower development in the suburban and rural districts included in the urban postal districts. Thus in Germany the development in the large cities and among the commercial classes was far in excess of that in the Empire as a whole, and not very far behind that in America.

In the rural districts, the situation was the reverse. In the United States the development in the state of New York as a whole was greater than in the metropolis alone, being one telephone to each 31 inhabitants. The same was true of Illinois, where there was one telephone to each 24 inhabitants. But in such a purely agricultural state as Iowa the development was greater

but only the preliminary results are yet available. The German figures are taken from the annual statistical reports of the three German telephone administrations. Other European figures are taken from the publications of the International Telegraph Bureau at Berne.

than in states containing a large industrial population, being one telephone to 19 inhabitants. In Germany, on the other hand, in the postal district of Gumbinnen, an agricultural district in the eastern part of Prussia on the shore of the Baltic Sea, there was only one telephone to each 634 inhabitants, in the neighboring district of Königsberg one to 469, and in the district of Oppeln in Silesia one to 492 inhabitants.

The interesting question now presents itself: to what extent was the low development of telephony in the German rural districts the result of the policy of the telephone administration, particularly of the long maintenance of the universal flat rate?

Some light is thrown on this question by a comparison of the development in certain portions of rural Germany during the period the single flat rate was in force with that in adjacent territories in which the rural districts enjoyed lower rates. Thus the flat rate in Wurtemberg for a decade previous to the going into effect of the reform of 1899 in the imperial telephone area was just two thirds as high as the flat rate in the latter area, and almost as low as the lowest rate introduced by the reform of 1899. In 1902 the reformed rates in both Wurtemberg and the imperial telephone area had been in force for two years. The telephone development in Wurtemberg was then 1:146; in the adjoining postal districts of the imperial area, those of Baden and Hohenzollern, it was 1:166; in the districts of Karlsruhe and Konstanz it was 1:184. In Bavaria, where the imperial telephone rates had also been in force up to 1899, the development was 1:158. These districts resemble each other somewhat closely in economic characteristics and importance. Another comparison can be made between the development in the postal district Kiel, which includes the Danish portions of the German Empire (Schleswig and a part of Holstein) and Denmark itself. In 1902 the development in Kiel was indicated by the ratio 1:167, in Denmark 1:64. After allowing for the exceptional development in the city of Copenhagen, Denmark still displayed a use of the telephone in local exchange operations twice as extensive as that in Kiel.

Finally the development in the districts in the southwestern corner of the empire may be compared with that in Luxemburg.

The character of the exchange service in that small principality is decidedly modest, but well adapted to the needs of the local population. The development in 1902 was indicated by the ratio 1:113. In the adjoining German postal districts of Aachen, Trier and Metz the ratios were 1:170, 1:376, and 1:448, respectively. These figures would seem to show that the rate-policy of the German telephone administration had greatly retarded the introduction of the telephone into the rural districts. In the adjoining districts of France, however, under the policy of local initiative, the rural population had been free to develop its local service to suit the local needs. The figures for the departments adjoining Luxemburg are not separately available, and hence a separate computation with regard to the most comparable districts cannot be made. But in the provincial departments as a whole it was about 1:650. Consequently the rural development at this period was even less than in Germany. It is clearly impossible to prove very much with the statistics of development.

In Germany the need for telephone exchange service did not begin to be felt in the rural districts until long after the service was well established in the large cities. The same circumstances which prevented the agricultural classes from desiring exchange service until long after its use had become a necessity to the commercial classes likewise prevented them from making such an extensive use of it after they had once made a beginning. Thus in Wurtemberg as late as 1906 Stuttgart, with less than one tenth of the total population, had more than two fifths of the telephones of the kingdom. The same conditions prevailed in the other parts of the empire. In fact, in all parts of Europe, the exchange service in the rural districts developed less rapidly than in the large cities. In France, in 1889, when the government took over the complete control of the telephone business, 6,255 out of the 11,314 subscribers in the whole country, or considerably more than half, were in Paris alone. In 1902, after a dozen years of the policy of local initiative, 41,602 out of 94,350 subscribers, or 44 %, were in Paris. This was more than twice the proportion of German subscribers which were to be found in Berlin at the same time. Even in Scandinavia, where the rural districts have felt the greatest

need for a telephone service, and have made the greatest efforts to supply themselves with telephone facilities, the same phenomenon can be observed. On January 1, 1907, the number of telephones per hundred inhabitants in Stockholm was 15.55; in the rest of Sweden 1.71. This instance is, of course, exceptional, on account of the long continuance of competition in the Swedish capital, but the situation in the other two Scandinavian countries is normal. In Norway, at the same date the number of telephones per hundred inhabitants outside of the capital was 1.53; in Christiania 5.90. In Denmark the figures are for the rural population 1.48; for that of the city of Copenhagen 6.20. The discrepancy between metropolis and country was less in Scandinavia than in Germany, but the fact that it exists at all shows that other factors besides rates and the policies of the telephone administrations in general exercised an important influence over telephone development.

Some further light is thrown on this question by a consideration of the nature of the extraordinary rural development in such an American state as Iowa. In the United States in 1902 the census authorities distinguished three classes of telephone systems, commercial systems, mutual systems, and independent farmer or rural lines. The first included all systems operated primarily for revenue. The second included all those operated through a voluntary arrangement among persons deriving benefit from the service, revenue being merely incidental to the operation of the system. The third included all lines having no regular exchange or central office. These lines were often operated under conditions similar to those controlling the mutual systems. In 1902 there were 994 mutual systems and 4,985 independent farmer lines situated in rural districts, that is, in places with less than 4,000 inhabitants. Of the total of 3,157 commercial systems 2,627 were situated in rural districts. Altogether over 28 % of all the telephones in the United States were situated in the rural districts.

They were not, however, evenly distributed throughout the rural districts of the United States. On the contrary, these rural systems and independent farmer lines had developed almost exclusively in the great agricultural region of the Middle West. Of

the whole number of independent farmer lines 83.7 % were found in the North Central division of states. The concentration of the mutual systems and of the rural commercial systems in the same division of states was almost equally marked. Indeed, 18 % of all mutual telephone systems were situated in the single state of Iowa, and more than half of all the mutual systems in the country were situated in the four states of Iowa, Illinois, Indiana, and Missouri. This exceptional spread of the use of the telephone in the Middle West was the result of the spirit of local initiative which manifested itself throughout the grain region of the Mississippi Valley with the return of prosperity after the period of hard times which ended in 1896. The expiration of the fundamental Bell patents in 1893 removed the greatest obstacle to the spontaneous growth of the rural telephone service as soon as good times should return. In the entire period prior to 1896 only 37 mutual telephone systems were established in the United States. In the four years, 1896 to 1899, 212 such systems were established, and in the next three years 181, 269, and 295, respectively. These figures will serve equally well as an index of the growth of independent farmer lines and of rural commercial systems. But this was a development which was confined to the corn and wheat belt. In the cotton belt the rural development was comparatively trivial. Whereas there was one telephone to each 19 inhabitants in Iowa, there was only one to each 134 in Alabama.

In the Southern states, however, private enterprise and local initiative were as free as in the Middle West. The numerous manufacturers of telephone instruments were as eager to place their orders in one locality as in another. There was nothing in the legislation of the Southern states to prevent speculative business men, or prospective users of the telephone, from adopting the same policy towards the development of the service in the South as was adopted in the Middle West. If the development of the rural telephone service in the one locality failed to keep pace with that in the other, the explanation must be sought in circumstances wholly unrelated to the management of the telephone business. In other words, the explanation must be sought not in the character of the supply but in that of the demand.

The demand for telephone service in the rural districts of Germany could no more be met by mutual exchange systems and independent farmer lines than in the cotton belt of the United States. In Wurtemberg, for example, where the German rural telephone policy was applied to best advantage, the number of telephones per capita in 1902 was a trifle less than in Alabama. In population the two states are not dissimilar, Alabama having in 1905 about 1.9 million inhabitants and Wurtemberg at the same date about 2.3 million inhabitants. In the latter state there were on March 31, 1902, altogether 178 exchange systems. Of these one had over 5,000 subscribers, two between seven and eight hundred, eleven between one and five hundred, sixteen between fifty and one hundred, and all the others — 148 in number — had 50 subscribers, or less. So far, the telephone facilities of Wurtemberg were inferior to those of Alabama. Besides this local exchange service, however, Wurtemberg possessed a rural-urban toll service to which Alabama could show no counterpart. There were 1,078 telegraph offices open to the public, of which 686 were equipped with telephone instruments. From 675 of these 686 telegraph offices with telephone equipment, long-distance telephone connection could be established with any of the 178 places having exchange systems. Moreover, telephone connection could be established between any two of these rural offices themselves. The effect of these rural public call offices was to extend the telephone service in the form in which it was chiefly wanted to nearly four times as many places as enjoyed a local exchange service.

This effect is reflected in the figures of the average number of messages per telephone instrument, classed as local and toll respectively. In the United States in 1902 the average number of local messages per telephone in the commercial exchange systems was 2,179; the average number of long-distance and toll messages was 54; the ratio between the two was 40 to 1. The local and long-distance messages per telephone instrument in mutual exchange systems were 1,102 and 8 respectively; the ratio between the two was 138 to 1. In the same year in Wurtemberg, the number of local messages per telephone was 1,864; the number of long-distance and toll messages 570. The ratio between the

two was 3.3 to 1. These figures show clearly the greater proportion of inter-urban and rural-urban traffic in the total traffic of Wurtemberg. This is a mode of employing the telephone which would hardly have been possible unless both telephones and telegraphs had been under the same centralized management. Without doubt the high flat rate that prevailed throughout most of Germany prior to 1900 deterred some rural villagers from subscribing to the telephone service, but the great mass of them were prevented from subscribing by circumstances over which the telephone administration had no control. The most important reason why the German rural population possessed fewer telephone exchange facilities in 1902 than did the American was that in Germany there was less use for that kind of telephone service in the rural districts.

The wide divergence between telephone development in the United States and in Germany as a whole cannot be explained solely on the same ground. The lively competition, which sprang up in most parts of the United States after the expiration of the fundamental Bell patents, has unquestionably given an impetus to the later growth of the industry which would have been lacking under any system of monopoly. But competition, as a permanent condition in the telephone industry, is out of the question. Temporarily, without doubt, it stimulates the increased use of the telephone, but the appearance of prosperity which is thereby imparted to the industry is specious. Sooner or later, in one form or another, the community must pay the bill for this forced development. The service cannot possibly attain its greatest utility until competition has given way to monopoly. So far as the greater development in the United States is the result of a needless duplication of plant, which not only wastes the country's resources but prevents the service from attaining its greatest utility, it is a development which brings no corresponding advantage to the country as a whole.

Apart from the effects of competition, the unequal use of the telephone in exchange operations in the two countries is chiefly the result of conditions that have no connection with the character of telephone management. These conditions on the contrary

exert their influence over the development of the industry in the same way, though to different degrees, both under private ownership in the United States and under public ownership in Germany. On January 1, 1907, the development in New York City — the greatest American exchange system — was almost twice that in Berlin — the greatest German exchange system. Yet the discrepancy was not so great between these two cities as it was between different parts of New York itself. In Manhattan and the Bronx there were 10.58 telephones per 100 inhabitants, whereas in Brooklyn there were 4.51 and in the borough of Queens and Richmond only 4.36.¹ The same phenomenon is equally noticeable in Germany. In the wealthy city of Frankfort there were on January 1, 1907, 4.78 telephones per 100 inhabitants, whereas in Essen, the Pittsburg of Germany, there were only 1.89. The telephone business throughout New York City is under the same management, and the telephone business in both Frankfort and Essen is under the same management. Presumably the New York Telephone Company directs its affairs with the same energy and sagacity on either side of the East River, and the imperial telephone administration may be expected to display the same vigor on the Main and on the Ruhr.

Under any form of management the extent to which the telephone service will be used is limited by the circumstances under which the business is carried on. Under like conditions an enterprising administration will unquestionably build up a bigger business than a stupid and slothful administration, but under unlike conditions equally enterprising administrations cannot possibly accomplish the same results. The prime significance of the statistics of comparative telephone development in Germany and in the United States is not that the German government has managed its telephone business with less enterprise and sagacity than has been displayed by the private companies in the United States, but that the German people have less use for the telephone than have the Americans.

¹ Figures communicated by the N. Y. Tel. Co.

CONCLUSION

CHAPTER XXIV

THE ECONOMY OF PUBLIC OWNERSHIP

ACCORDING to the theory of the harmony of economic interests the best security for the production of those commodities which the community wants, and the best protection against the production of those which it does not want, is to leave business men free to engage in whatever branch of production they choose. For, it is argued, the test of a want that ought to be satisfied is the willingness of the consumer to defray the cost of satisfying it. Hence the desire of business men for a profit is a sufficient incentive to induce them to direct the production of those commodities that are wanted and no others. By permitting business men to compete freely with one another the amount of these profits may be reduced to a minimum, and the community will accordingly be supplied with the goods it desires at the lowest possible prices. The prosperity of a society that is organized in accordance with this theory depends, therefore, on the correctness of the prediction of the society's wants by business men, on their ability promptly and accurately to direct the productive forces of the community out of those channels where they are not wanted and into those where they are wanted, and on free competition between them.

In the telephone business competition is a failure. Considered as an automatic arrangement for maintaining an accurate adjustment of the supply of telephone facilities to the demand, it easily gets out of order. So long as it remains in order its effect is to diminish the utility of the service to render which telephone facilities are created. For a while it is capable of bringing about low rates and stimulating a rapid development. Sooner or later, however, the self-interest of the competitors or the disillusionment of the public authorities will cause the termination of competition and the substitution of a régime of monopoly. This has been the result everywhere in Europe where competition has once existed, except in Stockholm, and in Stockholm the bankruptcy of the

private company or the purchase of its business by the government is only a matter of time. Competition as a permanent status in the telephone business is neither desirable nor possible.

The alternative to competition is monopoly. But under a régime of monopoly the set of conditions from which is deduced the theory of the harmony of economic interests does not exist. The same motives of human conduct which, under a régime of free competition, are relied upon to secure to the community at reasonable prices the supply of those commodities and services which are wanted, no longer produce that result. There is, on the contrary, a direct antagonism of interest between the producer and the consumer. The latter, which is the community itself in the case of a business of general public importance, must make a special effort of some kind in order to provide a substitute for the automatic action of free competition. This special effort may take the form either of public regulation or of public ownership of the business in question.

The problem is twofold. First, there must be a substitute for the action of free competition as a protector against inefficient management and the uneconomical employment of the productive forces of the community. Secondly, there must be some means of assuring to the community its share in the results of efficient management and economy in operation.

Under a régime of free competition, the machinery of production in any community is equipped with an automatic governor, to use a simile from the realm of mechanics, which tends to establish and maintain a tolerably uniform standard of efficiency in the management of businesses of general public importance throughout that community. This governor is the phenomenon of a market price. The market price for any commodity or service marks the limit beyond which no business man can permit the expenses of production in his establishment to extend and yet continue to engage in that business. On the contrary, his entire profit depends upon his ability to put out his product for less than that price. The wider the margin between his expenses of production and the market price of his output, the greater is his profit. The existence of a market price furnishes an ever present

incentive to business men to cut down their expenses of production and thus eventually to dispose of their product at less than the market price. Those business men who fail to hold the pace set by their more capable rivals must lose their position in the market. Hence the existence of a market price acts as a safeguard against inefficient management and automatically promotes the welfare of the community which constitutes the market.

Under a régime of private monopoly the monopolist's desire for the maximum monopoly profit furnishes the same incentive for efficiency, but provides the community with no security that it will receive any share in the advantages of good management. The monopolist must be restrained from obtaining an exorbitant reward for his services to the community. The difficulty of making contracts with private monopolists which will reconcile their private interests to those of the community, which will secure the maximum utility from the monopolized undertakings at reasonable prices, has been the most important economic ground for the public ownership of such undertakings.

Under a régime of public ownership, however, the automatic governor of the machinery of production, which is provided under either régime of private enterprise, is lacking. Public monopoly prices may be established by legislative enactment or by executive decree. In either case the administrators of the monopoly have no pecuniary interest in reducing the expenses of production, for the members of the community which owns the undertaking in question cannot themselves direct its daily management. They have their own businesses to attend to in the first instance, or, so far as they are not business men, have their livelihoods to gain in other ways. They can only delegate their powers of management to particular members of the community. The latter will necessarily be under the influence of different motives from those which actuate the heads of business undertakings under a régime of private enterprise. Those who are to benefit by the good management of a public business undertaking, that is, those who are at once its owners and its patrons, must utilize their collective interest to fill the void left vacant by the absence of pecuniary self-interest on the part of the public business managers, and to

provide a fresh stimulus to efficient and economical management. For it is only by a stronger interest that an existing interest can be overcome or a failing interest revived. But the stronger interest is of no avail unless there be an adequate opportunity for its expression. Hence the problem of public ownership resolves itself into a problem of public organization.

The objection to intrusting the possession of a business of great public importance to the hands of the community in general instead of to somebody in particular is that the collective interest will not be made effective. The result will then be at best a public management characterized by hopeless mediocrity. The fundamental maxim of one great school of economic thought is that in fact such is the characteristic of the governmental management of business undertakings.¹ The attitude of this school is neatly epitomized by the remark attributed to one of its greatest leaders, Herbert Spencer: "Why should we hope so much from state agency in new fields, when in the old fields it has bungled so miserably?" According to this school, private agency is always to be chosen for the conduct of business monopolies, wherever it is possible, in preference to that of the state, on the ground, stated baldly, that it is the lesser of the two evils.

We are now in a position to affirm with tolerable certainty in the cases of at least three countries on the Continent of Europe that state agency either has or has not bungled miserably. The tests of the efficiency of the management of a business undertaking are these: is the demand estimated correctly? and is the supply adequate in quantity, satisfactory in quality, and delivered at a reasonable price? The evidence on which the response to the first of these test questions must be founded constitutes itself the response to the second. The standard of judgment as to the adequacy and efficiency of the telephone service supplied in Germany, Switzerland, and France and as to the reasonableness of the rates, should not be an arbitrary one, however, but should be based on the requirements of telephone users in the three countries concerned. Each consumer is entitled to judge for himself what

¹ Paul Leroy-Beaulieu: *L'État moderne et ses fonctions*; 3rd edit., 1900, Introduction, pp. vi-vii.

manner of service is a satisfactory equivalent for a given expenditure. The task of the disinterested critic should be confined to supplementing the judgments of the users, in so far as public opinion in a community may be ill informed in regard to the character of service which is supplied in other communities under similar conditions.

Applying this standard of judgment, it appears that the German and Swiss telephone authorities have maintained a telephone service that has been both adequate in quantity and satisfactory in quality. The Germans originally established a schedule of rates that was reasonable under the existing conditions, and although for a period, in consequence of the subsequent changes in the character of the demand, that original schedule fell out of accord with altered conditions, it was ultimately subjected to a succession of reforms, designed to readjust the rates to the new conditions and on a basis calculated to enable the community to derive the maximum utility from its telephone system. The Swiss secured a wider and more prompt utilization of the telephone than occurred anywhere else on earth, led the way in the substitution of measured service for unlimited service, and have ever operated a technically sound system at rock bottom rates. The French telephone authorities, on the other hand, have not succeeded in maintaining either an adequate quantity or a satisfactory quality of telephone service, nor in establishing their rates on a reasonable basis. In short, we find that on the basis of the experience of the continental European governments in the conduct of the telephone business, no general statement can be made concerning the efficiency of state agency in the conduct of business undertakings. The nearest approach to a general statement that can be made is that in some countries public enterprise has bungled miserably in the telephone business, and that in others public enterprise has not bungled at all.

The explanation of these contradictory results in neighboring countries is twofold. It lies partly in the different temperaments of the various peoples and partly in the different circumstances under which public authorities in the various countries have been called on to conduct the telephone business.

Walter Bagehot, in one of his political essays, has remarked that the men of Massachusetts could work any constitution. The men of Massachusetts themselves would scarcely claim such generous praise as their due, but all will agree that there is a measure of truth underlying Bagehot's statement. Some peoples possess to a greater degree than others the capacity for collective action. An excellent illustration of this dictum is furnished by the leading Teutonic and Romance peoples, the Germans and the French. The Germans are unquestionably endowed with a greater power of coöperation in the pursuit of common ends than are the French. The stranger who has been among the two peoples, even for a short time, cannot fail to observe the difference in their attitudes toward the conduct of public affairs. The German possesses an instinct of order and discipline which the Frenchman lacks. In his relations towards the public power, the former displays a respect for established authority, and habitually regards it as one of the most indispensable agents in the promotion of the general welfare. The Frenchman, on the other hand, is distrustful of the effects of governmental action, and has a greater regard for personal liberty when it conflicts with the impersonal interest of the community. The civil service is held in greater esteem in Germany than in France; the public official is regarded less as a necessary evil and more as a useful collaborator with the private citizen in his task of gaining a livelihood. The civil service in Germany offers an attractive career to men of high ability. In France such men prefer the freedom of private life. The Germans are thus able to maintain a higher standard of ability in their public administration, and the private citizen who is called upon to assist in the work of public business management takes more pride in performing his part conscientiously and well.

The differences in the national characters of the two peoples are reflected not only in their conduct of public business undertakings but in all their economic activities. The French are a frugal race, and well deserve their title of bankers of Europe. But they are not as enterprising as are the Germans. The French have had since 1870 the same opportunity as the Germans to conquer foreign markets for the products of the new industries of our time.

But they have not gained their share of the new business. While French foreign trade has increased slowly, German foreign trade has increased by leaps and bounds. The German merchant marine almost threatens the supremacy of the English in the carrying trade of the world. The French barely holds its own.

The contrast between the Frenchman's conservative contentment with his environment and the restless progressiveness of the German extends to all the economic activity on a large scale that has characterized the industrial development of recent years. In the fine arts the French more than hold their own. But in the realm of large scale industry, where capacity for collective organization rather than individual cleverness is the watchword of success, the French lag far behind. It is only the exceptional private industrial undertaking in France that can take business away from the German in a neutral market. In general, large-scale private business organizations are not managed in France with the efficiency and enterprise that is displayed in Germany. And if the French cannot vie with the Germans in the conduct of private business undertakings that require an efficient organization as the condition of success, they can hardly be expected to work their public business undertakings as well as do the Germans, even if they could organize them as well.

As a matter of fact, the conduct of public business is not so well organized in France as in Germany. As a result of the superior capacity of the Germans for collective action and of their more highly developed taste for public in preference to private enterprise when there is a choice between the two, they have gradually built up a highly efficient machinery for the conduct of public business undertakings. The problem of public ownership has been solved by the creation of a double organization. The community in its capacity of owner of business undertakings possesses a political organization, the purpose of which is to lay down the general rules for the conduct of the business and to supervise the general results of operation. This purpose is accomplished by means of the control over rates and over the budget. The community in its capacity of patron for its own business undertakings possesses an economic organization, the purpose of which is to

take part in the daily work of management and to insure the satisfaction of individual wants.

Each of these organizations serves as a check on the other. The political organization prevents the sacrifice of the interests of the owners, that is, the community as a whole, to those of any portion of the community which may be especially concerned in its operation. The economic organization prevents the sacrifice of the interests of the patrons to those of its owners. Both organizations act as spurs to the management, inciting it to a more economical and a more efficient conduct of affairs. The managers in their turn are endowed with a public trust and accorded a measure of public esteem corresponding to the extent of their responsibility. For the single motive of pecuniary self-interest the Germans have substituted an elaborate mechanism of checks and balances for the purpose of regulating the machinery of production. At bottom the German system of public business organization rests also on the pecuniary self-interest of the individual members of the community. But by the substitution of public business enterprise for private business enterprise, they have found a means of reconciling the interests of producers and consumers in the conduct of those businesses in which the policy of free competition is undesirable or unavailable.

In France the attempt has been less successful so to organize the representation of the economic interests of the community as to provide a substitute for the self-interest of a special class of business men in the operation of the machinery of production. The French mechanism has been constructed on the same principles as the German, but its structure is less complete. In the first place, the chambers of commerce and the chambers of arts and manufactures have never enjoyed the power of initiative displayed by the German chambers, nor do they represent to the same degree the several interests of all classes of the community. They do not act together as do the Germans, nor do they act at all except upon the invitation of the central administrative authorities. The presidents of the several chambers hold an annual meeting, but they do not seem to be able to initiate collective action. Instead of bringing an effective pressure to bear on the adminis-

trative authorities to secure positive action in desirable directions or of offering an effective resistance to the pursuit of unsatisfactory policies in the conduct of affairs, they have drifted helplessly along in the current created by other forces more powerful than their own. The check that should have been exercised by the economic organization of the community in order to protect the interests of consumers has been too feeble.

The result of the weakness of the organized representation of the community in its capacity of patron of the telephone service has been that the other check on the management of the telephone undertaking has had to bear too large a proportion of the responsibility for good management, and has possessed too large a measure of unbalanced power. This derangement of the mechanism of checks and balances is intensified by the peculiar political and financial conditions in France. In addition, a number of vicious administrative practices have been permitted to grow up in the conduct of telephone affairs. Hence the failure of the French to make a better showing in comparison with the Germans is not difficult to understand.

The first of the vicious administrative practices is the method of accounting. Since no accurate account is kept of the quantities of capital invested in the various public undertakings, it is impossible to ascertain whether the proceeds of operation of presumably reproductive undertakings are really sufficient to defray the interest and amortization of their capitals. An apparent surplus of current receipts over operating expenditures might be easily wiped out by the unknown fixed charges. Valuable plant in a progressive industry like the telephone might be depreciating with greater rapidity than the capital itself was being recouped. The only certain way of avoiding such a disaster is to pay for all fresh construction as well as for maintenance out of current receipts. By the adoption of such a policy the government is sure of its revenues, whatever may be the true relation between the cost of construction and the earning capacity of the undertaking. This is in fact what the French government has done in its telephone business, in so far as it has been forced to supplement the advances made by local authorities. In a stationary business such a

policy would be a sound one, but in a rapidly growing business its effect is to limit the expansion of the business by the amount of surplus earnings that can be squeezed from present patrons. At the same time the managers of the undertaking are incited to make plant last as long as possible, when true economy would often require its replacement before being worn out by more efficient apparatus. In a growing business such a policy tends to prevent the construction of an adequate supply of facilities, the maintenance of a satisfactory standard of service, and the establishment of rates on a reasonable basis.

The second of the vicious administrative practices is the failure to render an annual report of the year's operations. Millerand's public letter of May 1, 1900, is the only official report that has ever been made since the French government took over the exclusive management of the telephone business. The result is that the parliamentary control over the budget is ineffective as a check on the conduct of telephone affairs. The presumption that the deputies will be able to probe the details of the management of the business is not verified by experience. They do not have sufficient information on which to be able to question the responsible minister intelligently. They enter the discussion obsessed with preconceived notions, the accuracy of which they have had no opportunity to test. During the first years after the government acquired the business of the *Compagnie générale des téléphones*, a separate statement was made each year of the receipts and expenditures in that branch of the public business; but in 1892, in accordance with the policy of budgetary unity which was adopted at that time expressly to bring order out of the chaos into which French finances had fallen, the telephone budget was merged with the general budget of the state.¹ Thereafter the deputies were compelled to search out the telephone figures in the general accounts of receipts and expenditures. The special commissions on the section of the general budget relating to the postal administration might have done much to fill this deficiency in the nation's business practices, but they have regularly neglected their opportunity.

The result is that the all too limited time of the chambers of

¹ By § 3 of the *Loi des finances* du 26 déc., 1892.

Parliament is frittered away with the discussion of local or personal matters of comparatively trivial importance, and the broad questions of general policy fail to receive their proper share of attention. The few parliamentary critics of the general policy of the management are apt to be of the watch-dog-of-the-treasury type, whose chief concern is to cut down the estimates of the public officials to the irreducible minimum. This is especially the case in France, where long years of uninterrupted deficits have made economy the cardinal principle of public finance. Such critics act on the theory that the public officials may be safely trusted to ask for all the appropriations that are needed, and they consequently confine their attentions to the discovery of particular items that the public authorities do not need or can be induced to forego, at least for the ensuing year.

This method of public financial criticism is particularly effective in France. Under the French rules of parliamentary procedure the estimates of the various departments may be freely cut down either in the commission of the budget or on the floor of the chamber. Moreover the ministers do not always support one another in the face of parliamentary criticism. Even after the preliminary estimates have been agreed upon between the minister of finance and the minister in charge of the service for which the appropriations are desired, the two do not always act in harmony before the commission on the budget. The former does not always give the latter his strongest support when the latter is fighting against proposals in the commission to reduce the grants to be allotted to the service under consideration. Indeed, the minister of finance sometimes gives the impression that he is secretly glad to see his colleague's items cut down, as if the prospects for a favorable balance at the end of the coming year were thereby made brighter. Even after the revised estimates are reported by the commission to the chamber, a minister still feels himself free to accept additional appropriations initiated by the chamber itself. If his colleague at the head of the ministry of finance will not consent to such an increase, the disagreement is settled by a vote of the chamber.¹

¹ Docs. parl., 1907, Annexe no. 1247, p. 1907.

This procedure is possible only because of the peculiar state of parliamentary government in France. The responsible ministers do not consider themselves responsible jointly for their individual acts. A minister whose conduct of affairs gives rise to dissatisfaction can be forced to resign by a hostile vote in the chamber without the implication of his colleagues. Party politics are managed on a personal basis. The leader of the ministry may be changed several times by hostile votes in the chamber, though the same party may remain in power and often many of the same ministers may continue to hold office. The result is that each minister thinks of himself first and only afterwards of his colleagues.

Cabinet government in this form is especially unfortunate in its effects on the conduct of public business undertakings, particularly under the financial conditions that prevail in France. The cabinet as a whole feels too little sympathy with the efforts of the minister charged with the conduct of such an undertaking. He is too often left to fight his own battles both with Parliament and with the minister of finance. The defective operation of the mechanism of checks and balances has thrown into the hands of the latter a disproportionate share of the power over the conduct of public business operations affecting the public revenues. The public officials charged with the conduct of the telephone business have become little more than his mere subordinates. There is consequently no adequate curb to his desires for revenue. The French government's long-standing need for funds has bred in the minds of ministers of finance a spirit of economy that is scarcely to be distinguished from avarice. This would not be so unfortunate if the ministry enjoyed a greater security of tenure. Under the existing circumstances each successive minister of finance thinks chiefly of establishing a favorable balance during the ensuing year and does not trouble himself greatly about what is to come after. Hence he is strongly tempted to sacrifice permanent soundness to present profits in the management of public business undertakings. Whether he is negotiating with the chief of the telephone service or with that of the department of fine arts, he is under the influence of precisely identical motives in arranging his budget for the year. Proposed expenditures for multiple

switchboards and for marble statues are judged on the same grounds. Proposed expenditures for works that would more than pay for themselves before worn out fail to receive his sanction simply because they would diminish his prospects for a surplus at the end of the ensuing year.¹

The nature of the defects in the management of the telephone undertaking was recognized by the parliamentary authorities within half a decade after the government acquired the complete possession of the exchange business. The commission on the budget for 1895 reported: "It is difficult not to perceive that the administrative system when applied to such an undertaking does not lend itself easily to improvements, to reforms, to a progressive management of the business, which those at the head of the undertaking, if they were their own masters, could easily bring about to the great advantage of the public."² The commission went on to observe that the administrative authorities seemed paralyzed, when it was a question of improving the service. For several years the increased appropriations that had been needed for desirable improvements had been made only by the agency of parliamentary initiative. This practice, it declared, was dangerous. For Parliament was ill fitted for the task of planning new construction, and was likely needlessly to burden the budget without greatly improving the service which had aroused its solicitude. The administrative authorities themselves should take the initiative in devising fresh expenditures, and the function of Parliament should be confined to restraining an excessive zeal on the part of the administration.

The dependence of the telephone management on Parliament for the sanction of each and every item of expenditure has another disadvantage. It prevents the management from spending money promptly for objects not anticipated at the beginning of the year when the budget is framed, although such expenditures would effect a real saving in the conduct of the business. Thus the management cannot take advantage of favorable fluctuations in the price of

¹ Steeg, p. 1853. Cf. Yves Guyot: *Trois ans au ministère des travaux publics*; 1895, p. 55.

² Docs. parl., 1894, Annexe no. 966, p. 1863.

materials to anticipate its future consumption. It is also impeded in attempts to meet unexpected demands for fresh construction, which may arise during the course of the financial year. The German telephone authorities do not hesitate to incur expense for works not authorized in the budget, when they deem such action in the public interest, and rely upon a subsequent vote of the Reichstag to justify their proceeding. The French never do this, but occasionally transfer sums voted for one purpose to apply them to another. After the destruction of the Gutenberg exchange at Paris in September, 1908, the chief of the telephone service contracted for new apparatus at an expense of several million francs without waiting for authorization from Parliament, and justified his action by obtaining a special decree from the *Conseil d'État*. Parliament was not then in session and was not to assemble for several weeks. Yet he was severely criticised for doing this.¹ In general the inability of the business managers to act freely on their own responsibility for the good of the service entails the loss of the best opportunities for effecting economies in the conduct of affairs.²

Various remedies for the improvement of French methods of public business administration have been proposed. One suggestion was that the receipts and expenses of the telephone undertaking should be stated together in the general budget in order that the deputies could obtain a clearer idea of the true position of affairs.³ The advocate of this reform did not venture to suggest an independent budget for the telephone business, realizing that such a proposal to depart from the principle of budgetary unity would do violence to the traditional French notions of sound public finance and consequently have no chance of acceptance. However, even as it was, the suggestion bore no fruit.⁴ Another proposal was that the government should abandon to the telephonic authorities all receipts in excess of the official estimate

¹ *Débats parl.*, Ch. des dép., Dec. 17, 1908; speech of M. Doumer, rapporteur-général, reported in *L'Action*, Dec. 18, 1908.

² Steeg, p. 1851.

³ *Débats parl.*, 1906, pp. 1393-1394, speech of M. Chastenet, March 17.

⁴ Cf. remarks of Louis Barthou, Minister of Public Works, Posts, and Telegraphs, Dec. 3, 1906; *Débats parl.*, 1906, p. 2854.

incorporated by the minister of finance in the budget.¹ Thereby the government would lose no revenues on which it had counted to establish the balance for the coming year. Had such a policy been in effect during the five years preceding the outbreak of the crisis of 1905, the telephone authorities would have obtained the use of a quantity of additional capital sufficient to have made all the improvements in the Paris exchange system which had been promised by Millerand in 1900, but which had not been carried out on account of the refusal of the minister of finance to give his consent to the necessary appropriations. A third suggestion was that the government should content itself with a fixed proportion of the annual surpluses of the telephone undertaking and leave the rest to be reinvested at the discretion of the management in the extension of the business.² None of these suggestions found favor with the government of the day, and no improvement has been made in the methods of conducting the telephone business.³

The evil results of the methods of financial control over telephone operations in France are not unlikely to manifest themselves also in Italy. The financial policy adopted by the Italian government by the acts of 1903 and 1907 is essentially a reproduction of that followed with such disastrous results in France. Since both parliamentary procedure and governmental financial distress are much the same in the two countries, there is little reason for expecting the Italians to make a better success of their telephone undertaking than have the French. Even in Germany, since the telephone accounts are merged in the general budget of the state, this peril is not sufficiently guarded against. The German imperial finances have been allowed to fall into a state of chronic deficits. The failure of recent attempts to restore the

¹ Sembat, I, pp. 1388 ff.

² Steeg, p. 1853.

³ The danger of the combination of the budget of the business undertakings of the state with its general budget was fully realized by the leading French financiers. Thus Rouvier, then president of the council of ministers, employed this danger as an argument against the repurchase of the Chemin de fer de l'Ouest in the debate in the Chamber of Deputies on Jan. 26, 1904. *Journal Officiel, Débats parl., Ch. des dép.*, 1904, pp. 139-142. In reply it was pointed out that the combination was not necessary. Cf. Edgar Milhaud: *Le Rachât des chemins de fer*, 1904, pp. 220-221. Cf. also Paul-Boncour: *Les Syndicats des fonctionnaires*, 1906, p. 57. The lesson of the postal crisis, he said, is budgetary autonomy.

balance between income and outgo can only have served to intensify the desire of the German government to discover additional sources of revenue in its business undertakings. The possibility of converting the telephone undertaking into a fiscal monopoly and of securing large profits at the expense of good service is, however, less in Germany than in France or Italy, because the patrons of the service are better organized and more capable of offering an effective resistance to such a purpose.¹ The telephone management is subject to the domination of the fiscal authorities in Germany as in France, but the German fiscal authorities themselves occupy a stable and independent position which the French do not. They know they will reap where they sow. Finally, the Germans have had too much experience in the conduct of public business undertakings ever to imitate the hand-to-mouth financial policy of the French. Moreover, the German telephone authorities have a secure tenure of office and are amply protected against the perpetual perturbations of party politics. Parliamentary procedure and the relations between the legislature and the executive are such as to give the public business managers both the responsibility for the good conduct of business operations and the power to carry out their own ideas. These circumstances guarantee the continuity of their business policy and make their interest lie in planning for the future as well as for the present.

It is to Switzerland that we must turn for the most smoothly working public business organization. There we see the most generally satisfactory distribution of power and of responsibility between government and public, between trained expert and untrained laborer. The separation of executive and legislature in Switzerland has brought with it the same advantages in the conduct of business undertakings as were exemplified by the experience of Germany. The change to a democratic in place of an aristocratic government has not swept away all the difficulties which have faced the German administration in its conduct of telephone operations, but it has mitigated some and changed the form of others. The struggle of conflicting interests in the making

¹ Cf. the remarks of Marcel Sembat in *Ch. des dép.*, Nov. 6, 1908; reported in *Le Matin*, Nov. 7, 1908.

of rates is as keen, but at least has ever been fought out in broad daylight and has not been confounded with alien questions of fiscal policy and financial reform. The development policy of the administration has been more easily controlled by consumers than has been the case in Germany, and the adoption of lucid and comprehensive methods of accounting has been enforced. The Swiss people have, moreover, shown themselves capable of dealing justly with the private electrical interests with which the public undertaking came into conflict. They may well be proud of their record in the telephone business.

The ability of public business managers under favorable circumstances to conduct with success the affairs of a going concern such as an established telephone business may be admitted, and yet it may be contended that it is unwise to adopt a policy of public ownership and operation for such an industry. This contention may be founded on the assumption that, although the principle of free competition is inapplicable to such a business as the telephone, the principle of free substitution should not also be abandoned. Thus the employment of technical experts to determine the application of improved processes and tools in a monopolistic industry is an obvious principle of business administration. If this principle is not observed, the proprietors of an undertaking run the risk either of failing to introduce an improvement that would pay or of introducing an improvement that would not pay. It is less obvious that the proprietors of an undertaking have an interest in preventing the too rapid introduction of paying improvements. Yet if they do introduce them rapidly, they may lose by the depreciation of their existing investment more than they save. There is a point, however, beyond which the improvement ceases to be a mere matter of detail in an established industry and becomes the foundation of a new industry. In so far as this new industry is capable of supplying the same need as the old, the proprietors of the latter will have an interest in preventing, if possible, a too rapid development of the new industry. If the threatened industry is a private venture, and the promoters of the new industry are free to compete for the favor of the consumer, the potential substitution of one for the other serves the public interest as well as free competition

between rival undertakings within an industry. In case consumers choose to transfer their patronage, the loss by the depreciation of the older industry, if any, falls directly on the shoulders of its unfortunate owners, and the public secures the immediate benefit of the improvement at no apparent cost to itself. If, however, the government owns the threatened industry, what the public gain in their capacity of consumers by the immediate introduction of the improvement may be wholly or partially offset by their loss in their capacity of taxpayers. Hence the public authorities responsible for the management of the public business undertaking may be tempted to employ their authority to oppose the establishment of the new industry.

From the point of view of the proprietors of telegraphs the telephone was such an improvement, or, more strictly speaking, it became such an improvement when its application was extended from local exchange to inter-urban and long-distance service. If the application of wireless telegraphy and telephony to overland communication should become commercially practicable, they would be improvements of a similar nature. We have seen that the public telegraph authorities on the Continent of Europe did in fact employ their authority in one way or another to retard the introduction of the telephone as a substitute for the telegraph. The fear that this attitude on the part of public authorities intrusted with the management of public business undertakings will materially obstruct industrial progress constitutes one of the most formidable objections to the policy of public ownership.

It is true that under a régime of public ownership the consumer cannot escape the loss that may be occasioned by discarding valuable plant in order to make way for improvements. It is not true, however, that the consumer escapes all share in the loss that may be occasioned by the equally rapid introduction of improvements under a régime of private ownership. The scrapping of a quantity of valuable plant, still capable of good service, is always a matter of regret, not only from the standpoint of the owner of the plant but from that of the whole community, for it means that a corresponding quantity of the capital at the disposal of the community has been destroyed. The labor required to replace that

plant might have been employed to satisfy some hitherto wholly neglected want. In reckoning the net gain to a community from the introduction of an improvement, allowance must accordingly be made for the possible loss occasioned by the depreciation of existing investments. In other words, precisely the same improvement may be worth less in one community in which it renders useless the results of much past labor on the part of members of that community than in another where it does not have that effect.

This is a circumstance of which the self-interest of private business men takes no account. It matters not to the promoter of a telephone undertaking that a telegraph line which his undertaking is likely to render less useful has cost much toil and trouble. It is enough for him that he can make a bigger profit by promoting the telephone undertaking than he can in any other way. To the community, however, his telephone undertaking, if established more rapidly than is required to supplement the telegraph or replace it as it wears out, may be worth much less than a number of other applications which the business man might have made of the same quantity of capital. Thus the interests of the private business man and of the community as a whole may not coincide with respect to the rapidity of introduction of such an industrial improvement. If these interests do not coincide, the doctrine of the harmony of economic interests breaks down.

If the determination of the rate at which industrial improvements shall be introduced is abandoned to the blind operation of free competition in an industry in which there is much to lose through industrial waste as well as much to gain through industrial progress, there is no certainty that the interests of the public will be secured. The alternative is to withdraw the threatened industry altogether from the realm of free competition and to intrust to the trained expert the task of protecting the interests of the public. The trained expert may make mistakes, yet by dispensing with his services a community is likely to secure more speed in the introduction of valuable improvements at a disproportionate cost. The greater the durability and the more specialized the nature of the existing plant, the greater the probability that speed in the introduction of improvements will be secured beyond a certain point

only by the sacrifice of true economy. Under the competitive system the matter is beyond the control of the community. Only by a deliberate choice of monopoly in such an industry as the telephone can the public take the measures necessary to insure the most economical dispensation of the productive forces of the community. European experience in the telephone industry does not enable us to determine whether competition or monopoly would have secured the more satisfactory combination of progress and economy.¹ We can only conclude that industrial progress is no safer in the hands of the technical expert employed by a private monopoly than in those of the technical expert employed by the public.

It is impossible to review the experience of the continental European countries with the telephone industry without being led to attempt, at least briefly, an interpretation of the broader economic movement of which the public organization of the telephone business is one part. A general reorganization of the productive forces of the community has been taking place. We have seen local voluntary organizations of consumers grow up and gradually assume a more and more important part in the direction of the economic activities of the community; we have seen occupational voluntary organizations of workers grow up and gradually assume a more and more important part in the direction of

¹ The only country of importance in which no governmental obstacles were interposed to impede the free substitution of the telephone for the telegraph was the United States, for the United States was the only important country in which the government did not own the telegraphs at the time of the invention of the telephone. Yet the United States is the country in which the heaviest tax was laid upon the infant telephone industry by the interests in control of the telegraphs. By the agreement of November 10, 1879, between the National Bell Telephone Company and the Western Union Telegraph Company the former was bound to pay over to the latter one fifth of the entire receipts from the telephone business. The most that any European state telegraph administration ventured to charge was the ten per cent royalty collected from the telephone companies in the United Kingdom by the British government. (See my article on the Telephone in Great Britain in the *Quarterly Journal of Economics*, November, 1906.) The German and Swiss policy of exacting guarantees from prospective users of new telephone lines during the early development of the industry, though more inconvenient to telephone users than the American policy of paying a share of the gross receipts to the telegraph monopoly, bore much less heavily on the infant industry.

the conditions of employment; we have seen the central political organizations, known as states, reach out and take possession of great business undertakings. Perhaps to the casual observer this last would appear the only aspect of the economic evolution of modern times that concerns the student of public ownership. A closer examination shows the error of this view. In fact, it is the organization of the market by the consumer, the assertion by the wage-earner of his right to share in the control of the general conditions of employment, and the recognition by the public of true worth of the specially trained expert in the conduct of big industrial undertakings, that are the most important features of the broader economic movement of recent years. By displacing the business man from his autocratic position at the head of such an industry as the telephone and distributing his functions among the various rising elements of industrial organization, the European governments have simply fallen in with the spirit of the times.

The great advantage of the ownership of business undertakings by the community lies in the power that goes with possession. While the ownership of businesses of general public importance remains in private hands, there is no protection for the ordinary economic interests of consumers except by free competition or by public regulation. In the telephone business the former is neither desirable nor possible. The latter may be obtained in only two ways: (1) by special contract between the private owners and the public authorities; (2) by direct legislative action, subject to appeal to the courts for the protection of individual rights. Under either method of public regulation, the antagonism of interest between the private monopolist and the consumer may be subdued but is never removed. It was in order to possess complete control over the management of the telephone business that the governments of Europe adopted the policy of public ownership. By retaining complete control in their own hands, those governments have had the opportunity to adopt methods for the establishment of rates and the maintenance of service that would have been impossible under any form of private ownership. In a business such as the telephone, the best security for the establishment of reasonable rates is to give those who are to pay the rates a voice

in their making, and the best security for the accurate adjustment of the supply of telephone facilities to the demand is to give to those who are to use the facilities a share of the responsibility for their creation. Regarding public ownership from the standpoint of production, the extent to which the communities that have taken the direction of their telephone service into their own hands have profited by their venture has depended largely upon the skill with which they have organized their business administration.

Experience has shown that not all peoples possess the capacity for such organization in the same degree. Nor could the same people create an equally efficient public business organization in all industries. In fact the telephone industry has offered peculiar advantages for the experiment of dispensing with the services of the private business man. The effectiveness of public business organization in the telephone industry has been largely dependent upon the peculiar nature of the industry and the extent of the market. The telephone industry can only attain its highest utility when managed as an exclusive monopoly in a given territory. The market for telephone service comprises the whole body of individuals in the territory covered by a connected telephone system, and in practice can be limited for administrative purposes without great inconvenience by the political boundaries of a country. Hence when owned by the government, owner and consumer are identical. Furthermore, the mechanical nature of the service and the stability of the demand for the service make possible accurate prediction of the demand by statistical methods. In those industries in which these conditions are present the policy of public ownership is best fitted to enable the community to avoid both the periodical overproduction of free competition and the perpetual underproduction of private monopoly.

The essence of the transition from private to public ownership is the replacement of the business man (or business corporation) by the organized self-directing community. The effect is the transfer of the risks of the undertaking from private promoters to the community as a whole. In practice this risk is shifted by the community in its political capacity of producer to its individual members in their economic capacity of consumers. The result is a less

rapid introduction of technical improvements than under a régime of free competition, but a more economical dispensation of the public resources. Under public ownership the consumer saves the reward for risk which under private ownership he would have to pay in the form of higher rates. This saving is the apparent recompense for the slower rate of industrial progress. But once it is recognized that in a particular industry the hypothetical alternative of free competition is an illusion, it becomes evident that the community's saving by the assumption of the risks of the enterprise is not a mere recompense for the sacrifice of a more rapid rate of industrial progress, but a clear gain. For under the actual alternative to public ownership in such an industry, namely a regulated private monopoly, there is no greater security for sound industrial progress than under public ownership, and it is certain that at least a portion of the advantages of industrial progress will be appropriated by the monopolist, solely by virtue of the fact that he is a monopolist. The great merit of public ownership, therefore, as an agent of production, is that under the proper industrial conditions it fulfills more economically than any other method of industrial organization, the direct purpose of production, — that is, the supply of the consumer with the kind and quantity of goods that he desires.

BIBLIOGRAPHICAL APPENDIX

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THE chief printed sources of information used in this study of public ownership of telephones on the Continent of Europe are as follows:—

I. OFFICIAL PUBLICATIONS

1. *INTERNATIONAL*

PUBLICATIONS OF THE INTERNATIONAL BUREAU OF TELEGRAPH ADMINISTRATIONS AT BERNE, SWITZERLAND

These include a periodical, the *Journal télégraphique*, cited as J. T. (see p. 78), in which are regularly published the official communications from constituent telegraph administrations, mainly of a statistical nature, copies of all statutes and important decrees and ordinances, and contributed articles, mainly of a technical nature. The bureau compiles and publishes an annual summary of the statistical reports of the constituent administrations, covering the results of telegraph and telephone operations in every important civilized country except the United States, cited as J. T., Statistiques (see p. 336). The bureau has twice published special summaries of telephone rates in force in all countries reporting to it, once in 1894 and again in 1905, cited as Tarifs tél., I and II (see p. 36). (In the United States, the bureau of the census has issued elaborate special reports on telegraphs and telephones as of 1902 and 1907, the latter of which unfortunately was not published until this book was on its way through the press.)

2. *NATIONAL*

A. ADMINISTRATIVE DOCUMENTS

(a) *Germany*. The imperial postal, telegraph, and telephone administration publishes an annual report of its conduct of affairs; a quinquennial summary of statistical and technical progress, cited as Ergebnisse R. P. T. (see p. 66); and a monthly periodical, the *Archiv für Post und Telegraphie*, cited as A. P. T. (see p. 68), containing current information from both German and foreign telephone administrations and

contributed articles, chiefly on technical subjects. The Bavarian and Wurtemberg administrations publish annual reports.

(b) *Switzerland*. The Federal Council publishes a very full annual report on its telephone business, and from time to time upon request sends in to the Federal Assembly detailed reports on special topics.

(c) *France*. There are no regular published reports from the telephone administration (see pp. 295, 450).

(d) *Continental Europe*. Summaries of all published reports are printed in the *Journal télégraphique* and usually in the *Archiv für Post und Telegraphie* as well.

B. LEGISLATIVE DOCUMENTS

(a) *Germany*. The proceedings in all committees of the Reichstag are printed in full (*Drucksachen des Reichstages*).

(b) *Switzerland*. The proceedings in all committees of the Council of States and of the National Council are preserved in manuscript, and may be consulted in the federal library at Berne.

(c) *France*. The committees on the budget usually report through one of their number the results of the proceedings in the committee, before which representatives of the telephone administration are required to appear and explain their use of the public money. These reports are printed as annexes to the debates.

(d) *Continental Europe*. In all countries with representative institutions the administrative officials may be required to appear, particularly when the budget is under consideration, before the popular branch of the legislature and answer questions put to them by the representatives of the people. Discussions may ensue, and are reported in full in the stenographic reports of parliamentary debates.

3. LOCAL

(a) *Germany*. The municipal governments issue reports upon local administration at regular intervals, which contain valuable accounts of their relations with the telephone administration.

(b) *Switzerland*. The cantonal and municipal governments issue annual reports, which contain valuable accounts like the German.

(c) *France*. The municipal governments issue annual reports, which are of little value outside of Paris.

(d) *Continental Europe*. There are good municipal reports in the leading cities generally, but they have not been examined for this study except in Holland and Italy, and in Vienna.

II. SEMI-OFFICIAL PUBLICATIONS

1. ASSOCIATIONS OF MUNICIPAL CORPORATIONS

(a) *Germany*. The proceedings of the German Städtetag contain debates on municipal problems, including that of telephone service. There is also a statistical year-book of German cities.

(b) *Switzerland*. There is a statistical year-book, as in Germany, published with the assistance of the municipal authorities.

(c) *Continental Europe*. Use has been made of the statistical year-book of Italian cities. One is also published in Austria.

2. ASSOCIATIONS OF CHAMBERS OF COMMERCE, ETC.

(a) *Germany*. The various commercial and industrial associations hold annual meetings and publish their proceedings. These often contain discussions of telephone affairs (see pp. 40, 173, 174).

3. LOCAL CHAMBERS OF COMMERCE, ETC.

(a) *Germany*. Annual reports are made to the imperial or state governments as the case may be. These often contain discussions of telephone affairs (see Chapter iii, and Index under Chambers of Commerce, etc.). Cited as HGK Stuttgart, Oberbayern, Mittelfranken, etc., as the case may be (see pp. 27, 32, 34, etc.).

(b) *Switzerland*. Annual reports are published, which are of much value in tracing industrial developments, as in Germany.

(c) *France*. Reports of chambers of commerce are of little value for the study of telephone affairs except in Paris. The official organ of the French chambers occasionally contains references to the telephone (see p. 297).

(d) *Continental Europe*. Reports are published, but have not been used (see p. 39).

III. TECHNICAL PUBLICATIONS

The technical periodicals devoted to the electrical industry give more or less space to the telephone. The *Elektrotechnische Zeitschrift*, the leading organ of the German electrical industry, has followed the development of telephony with the greatest care. Cited as E. T. Z. (see pp. 89, 355). For a note on the French technical periodicals, see p. 315. The technical literature, both in periodicals and in book form, dealing

with the telephone is enormous, and, since most of it is irrelevant, no attempt has been made to use it for this study of the telephone industry.

IV. MISCELLANEOUS BOOKS AND PAMPHLETS

These have been used only incidentally in connection with the study of the primary sources of information. For a list of secondary works dealing with the history of the optical and electrical telegraphs, see p. 3; dealing with the organization of economic interests, see pp. 39, 40; dealing with the legal position of the telephone in Germany, see p. 88; dealing with the relations between the telephone and other electrical services, see pp. 83, 84, 241, 242; and dealing with the history of the telephone on the Continent of Europe generally, see p. 355.

Books and other sources of information, cited in one chapter only, are cited the first time in full and thereafter by name of author or other convenient description. Books and other sources of information, cited in more than one chapter, are cited regularly by an abbreviation. All abbreviations used, except those of books, are noted above. The following abbreviations of the titles of books are employed in more than one chapter: Jung I (see p. 24), Jung II (see p. 3), and Lacombrade (see p. 269).

A study of the Telephone in Great Britain, written before the study of Public Ownership of Telephones on the Continent of Europe was begun, was published in the *Quarterly Journal of Economics*, November, 1906, and August, 1907.

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